REDEFINING OLD WOMEN'S PHASE POTTERY: A TYPOLOGICAL ANALYSIS OF CERAMICS ON THE NORTHWESTERN PLAINS

SHEILA MACDONALD
B.A., University of Alberta, 2008

A Thesis
Submitted to the School of Graduate Studies
of the University of Lethbridge
in Partial Fulfilment of the
Requirements for the Degree

MASTER OF ARTS

Department of Geography
University of Lethbridge
LETHBRIDGE, ALBERTA, CANADA

REDEFINING OLD WOMEN'S PHASE POTTERY: A TYPOLOGICAL ANALYSIS OF CERAMICS ON THE NORTHWESTERN PLAINS

SHEILA MACDONALD

Defence Date: November 8, 2014

Dr. S. Bubel Supervsior	Associate Professor	Ph.D.
Dr. K. McGeough Thesis Examination Committee Member	Associate Professor	Ph. D.
Dr. J. Cunningham Thesis Examination Committee Member	Assistant Professor	Ph. D.
Dr. S. Kienzle Thesis Examination Committee Member	Professor	Ph. D.
Dr. P. Vasey Thesis Examination Committee Member	Professor	Ph. D.
Dr. W. Xu Thesis Examination Chair	Professor	Ph. D.

Abstract

Ceramic artifacts recovered from late Avonlea and Old Women's Phase components in Alberta, Saskatchewan, and Montana, with dates ranging from 1200 to 200 years ago, have been referred to as Ethridge ware (Kehoe 1959; Walde 2006b), Saskatchewan Basin Complex: Late Variant (Byrne 1973), or simply as Old Women's Phase pottery. Despite the different names used to classify the ceramics, the vessels are typically recognised by their globular form, shouldered profiles, thick walls, vertical or flaring rims, and cord-roughened, fabric-impressed, or plain surfaces. The increasing number of ceramic artifacts being recovered from archaeological sites on the Northwestern Plains allowed for a refined typological analysis of this broadly described pottery style. Ceramic attributes, including profile form, surface finish, decorative elements, and quantitative measurements were used to identify temporal variations and loose regional trends. Several trends were too limited to confidently define as ceramic types, but one set of attributes consistently appear together and has been described as the *Ross ceramic type.* The results of this research provide a better understanding of the form and stylistic choices made by the potters of the Late Prehistoric Period on the Northwestern Plains.

Acknowledgements

I would like to thank the many archaeologists who contributed to the projects referenced in this study. Without your detailed work, this research would not be possible. Many of these reports are not easily accessible and I hope I have honoured your dedication.

To the experts in the field, Dr. Dale Walde from the University of Calgary and Dr. David Meyer from the University of Saskatchewan, thank you for taking the time to share your knowledge and allowing me access to the collections. Your previous research served as the foundation for this current study and has inspired me for years. I am also very thankful for the help from Karen Giering from the Royal Alberta Museum, Dr. Evelyn Siegfried and Cindy Scheer from the Royal Saskatchewan Museum, and Christie Grekul from the Bodo Archaeological Centre. The hours of searching through artifact inventories and providing space for me to work for weeks at a time has certainly added to the experience of this degree.

Thank you to everyone at the Archaeological Survey of Alberta, particularly Martina Purdon, Trevor Peck, and Wendy Unfreed for giving me access to the site forms and permit reports, lending an ear to brainstorm ideas, and always returning my emails. I would also like to thank the members of the Archaeological Society of Alberta Lethbridge Centre for giving me the opportunity to share my ongoing research and for welcoming me to the southern Alberta community. The archaeology students at the University of Lethbridge also have my warmest gratitude for supporting me through this journey, especially Holly Krause for your hours of tracing and shading my profile drawings. Special thanks to Wim Chamlet for your help setting up the Access database.

This project would not have been possible without my supervisor, Dr. Shawn Bubel. You took a chance on this pottery enthusiast and jumped in head first with me. Without your endless support and encouragement, the end may not have been reached, let alone started. You set a high standard in mentorship that is known by all you teach and I am so grateful to have had the opportunity to be part of your team. Thank you is not enough but will do for now.

I would also like to thank Dr. Kevin McGeough, Dr. Stefan Kienzle, and Dr. Paul Vasey for being members of my committee and always making time to talk things out with me. A special thanks to Dr. Jerimy Cunningham, not only were you a member of my committee, but you pushed me to think outside my comfort zone and I know I am a better archaeologist for it.

To my family, thank you for always supporting my adventures. I know it's taken some time to find my path, but I think I found it… for now. And to Brendan Shaw, you know how I feel. Even in my darkest times, you never doubted me. Not once. I am so excited for our future adventures.

I would also like to take the chance to thank Lady KJ MacAllister for being a continuous inspiration in my ceramic arts journey, the CASA Centre in Lethbridge for providing a space for me to play with clay, and to Elizabeth Mann who first gave me the opportunity to combine my two passions of pottery and archaeology.

Funding for this project came from the University of Lethbridge, the Archaeological Society of Alberta – Lethbridge Centre, and the Friends of Head-Smashed-In Scholarship.

Thank you.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

L	Lip	VCR	Vertical cord-roughened
R	Rim	GCR	General cord-roughened
N	Neck	Deco.	Decoration
S	Shoulder	Ext.	Exterior
B	Body	Int.	Interior
Bs	Base	Irreg.	Irregular
CWT	Cord-wrapped tool	Impr.	Impression

CHAPTER 1: Introduction

Ceramic vessels found in the Northwestern Plains dating from approximately 1200 to 200 BP are associated with transitional Avonlea and Old Women's Phase contexts. Similarities in ceramic attributes such as paste, form, and decorative elements have been used to create ceramic typologies throughout Alberta, Saskatchewan, and Montana during this time period. In recent decades, the increased number of ceramic artifacts recovered from these regions has resulted in a higher degree of typological variability in what has previously been referred to as *Ethridge ware* (Kehoe 1959), *Saskatchewan Basin Complex: Late Variant* (Byrne 1973), and simply as Old Women's Phase pottery (Loveseth 1982; Peach et al. 2006; Whatley 2004), which all have distinct cultural-historical implications. Changes in thickness, paste characteristics, profile form, and decorative elements could reflect individual differences or manifestations of temporal or regional patterns.

The current research project explored the ceramic variability from archaeological contexts in the Northwestern Plains that date from 1200 to 200 BP. Emphasis was placed on the typological implications of the ceramic variability which may be used to expand models for understanding ceramic production in the future.

Ceramic Classification Sematics

Typological variation has been commonly used as a basis for identifying the culture-histories of particular regions and time periods. The Willey and Phillips (1958) model for archeological phases is often used to define boundaries in contextual and spatial-temporal data. A cluster of typologically similar artifacts within a restricted region

and time period was referred to as an archaeological *Phase*. This method has carried forward into current models of archaeological contexts, such as the Old Women's Phase described by Reeves (1983a).

There is no consensus on how to create a classification system for comparing artifacts. The traditional approach for artifact classification was an intuitive method which involved sorting the artifacts into similar groups without predefining the criteria of divisions (Sinopoli 1991:49). There was an underlying researcher bias that was often not described in detail and prevented future studies from being replicated using the same methodology (Sinopoli 1991:50). Richie and MacNeish (Richie 1944; Richie and MacNeish 1949; MacNeish 1958) used this method in early Woodland ceramic classifications. MacNeish (1958) classified the ceramics from Manitoba by grouping them first into *wares*, consisting of shared paste, surface finish, and form, and then further divided these wares into *types*, based on decoration, diagnostic features, and spatial and temporal range. Although he did not discuss the significance of this hierarchal taxonomic approach, MacNeish (1958:138) stated that "it has been convenient for the archaeologist in describing and studying pottery to consider it under four main headings, i.e., the paste, the surface finish, the decoration, and the vessel form".

As a response to the growing number of ceramic wares and typologies that archaeologists started to name throughout North America, several methods of classification were formerly defined. Wheat et al. (1958) introduced the Type-Variety method as a way to maintain consistency across regions. They used a taxonomic method and defined a *ware* as "a large grouping of pottery types which has little temporal or spatial implication but consists of stylistically varied types that are similar

technologically and in method of manufacture" (Wheat et al. 1958:34-35). The *type* was defined as having distinct visual and texture characteristics within a restricted spatial and temporal distribution (Wheat et al. 1958:34). A *variety* was included in their overall type class, but they noted that it cannot differ in "design execution, surface finish, or character of paint or paste utilized, else the variety warrants designation as a type" (Wheat et al. 1958:35). They further emphasized that the variety could only deviate from the type in either technological characteristics, stylistic attributes, or have a more refined spatial or temporal distribution, but not a combination of these aspects (Wheat et al. 1958). The Type-Variety method requires the analyst to start with "potential variety units" and eliminate them if they are not represented. If the types and varieties revealed themselves they must be the constructs of the person or people who made them (Gifford 1960:342). Room for new varieties within a type cluster could always be accommodated.

An alternative analytical approach to artifact classification was described by Rouse (1960, 1972), which emphasized *classes* and *modes* as the unit for analysis rather than the type. His class was a pattern of shared attributes on a group of artifacts. A mode was a pattern of shared attribute features and was conceptualized as "any standard, concept, or custom which governs the behaviour of the artisans of a community, which they hand down from generation to generation, and which may spread from community to community over considerable distances" (Rouse 1960:313). He argued that the type was a cluster of modes that was only used by pre-historians to distinguish chronologies through space (Rouse 1972). Rouse (1960:318) stated that "the mode, therefore, is a natural unit of cultural study, whereas the type is an arbitrary one".

The difference between these two methods is that a single mode can be seen in multiple types (Rouse 1960). Classes can also be reorganized based on the technology, style, or function (Rouse 1960:315). Rouse (1960:314) suggested that the most natural way to initiate classification is to follow the artisan's production procedure: first divide the artifacts based on raw material, followed by manufacturing technique, then by form and decoration, then use. It must be noted that the latter classes are not necessarily dependant on the former. This analytical method puts more emphasis on the attributes themselves, but can make it more difficult to summarize the whole artifact into a single unit. The Type-Variety method, on the other hand, makes it easier to communicate and formulate culture-histories. Much of the literature explaining archaeological classification systems since the 1980s have combined these methods to facilitate attribute analysis while maintaining a type to describe large quantities of artifacts (Ashmore and Sharer 1999:110).

Whichever classification system is used, linking a ceramic "type" to the people who made the artifact is problematic. Rouse (1939, 1960, 1972) believed that modes represent the norms and mental templates of the groups making the artifacts. Spaulding (1953, 1954) argued that types are combinations of attributes that are "discovered" by archaeologists. It is clear that ceramic types can be identified using statistical analyzes to recognize the clustering of attributes. With statistically validated data many archaeologists would state that the types are in fact real and were also recognized by the people who made the object. Critical of this direct link, Ford (1938) suggested that types should only be divided when there are clear spatial and temporal differences. He further argued that types are the invention of the archaeologist and rejected the idea of the mental

template (Ford 1954). Gifford (1960:345) added that societies in general have a desire not to change; that they want stability and continuity. According to this theoretical framework, continuity should be represented in the type-varieties and the norms of the society. All culture-history approaches use a normative model for understanding culture, which implies that there is a "set of rules or norms that govern behaviour in a particular society" (Ashmore and Sharer 1999:36). These learned behaviors are passed from generation to generation and can be observed in the archaeological record through similar attribute features.

Critiques of culture-history and typological approaches highlight the bias in which particular attributes are chosen to define the cultural unit. Chilton (1999) chose to follow the positivist model defined by Hill and Evans (1972) for separating typologies. This model allows the analyst to choose which attributes they want to study after they have established their research question. Attributes such as paste characteristics, raw material choices, function, vessel wall thickness, and manufacturing techniques are options for interpreting ceramic variation (Chilton 1999). This model is compared to the empiricist model that Spaulding (1953, 1954) would have used to argue that types will cluster naturally and therefore are "truth" (Chilton 1999; Hill and Evans 1972:235). Chilton (1999:44) critiques this empiricist model stating that it assumes "continuity within and discontinuity between types, and by assuming the relationship between attributes of material culture to be static through time, the typological process masks a certain amount of diversity in material culture – the same diversity archaeologists often seek to understand".

These classification models have influenced previous ceramic analyzes in the Northwestern Plains. The inconsistencies in ceramic classification have led to the definition of the same group of vessels as Ethridge ware, Saskatchewan Basin Complex: Late Variant, and Old Women's Phase pottery in an area approximately 300 000 km² (Figure 1). These three ceramic types, which date from 1200 to 200 BP, reflect different culture-history models. The following section presents how these classification methods were used and their theoretical implications.

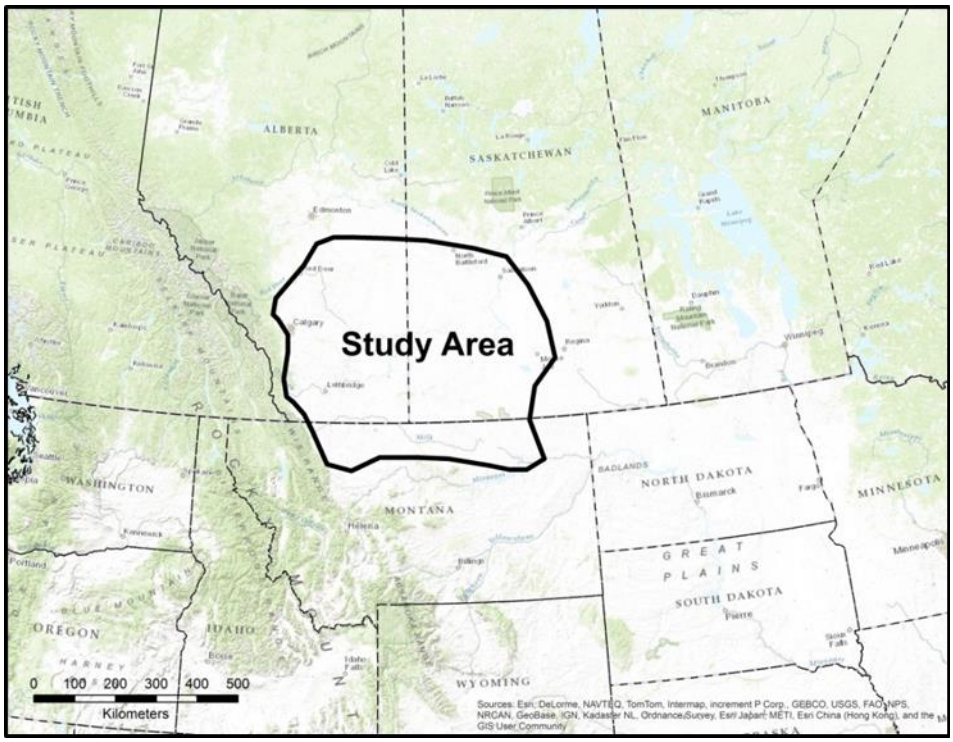


Figure 1: Map of the study area.

A Review of Late Prehistoric Ceramics from the Northwestern Plains

The earliest attempt to classify ceramics from the Late Prehistoric Period in the Northwestern Plains was in 1959 when Kehoe (1959:238-240) referred to them as Ethridge ware. This was based on the pottery that Wedel (1951) described from the Ethridge site in Montana. Kehoe (1959) identified Ethridge ware from 499 sherds in a

variety of private collections from as far north as Edmonton, east to Wainwright, and south to the Oldman River region near Lethbridge. Assemblages from the Marias and Milk River drainages in north-central Montana were also identified as Ethridge ware. Only four sites from Montana had spatial contexts, including the Ethridge, Galata, 24TL303, and 24TL304 sites, and none had a temporal context. A summary of Kehoe's (1959:240) Ethridge ware can be described as being globular or ovoid in shape, with rounded bottoms, slightly constricted necks, straight or moderately flaring rims, frequently angled shoulders, and flatted lips. The most common surface finish was cord-wrapped paddle impressions. The cords were 0.5-3 mm thick. Some were twisted and some consisted of a thick sinew. Less frequently, the surfaces were impressed with a twined-woven fabric. Most vessels were undecorated, but those that were displayed incised lines, linear impressions, cord-wrapped tool impressions, punctates, finger impressions, finger pinches, and fingernail marks. These decorative elements were found on the lip surface, upper rim edge, and on the shoulder.

Ethridge ware was included in Kehoe's larger *Pisamiks Tradition*, suggesting a Blackfoot origin. This tradition also included *Wascana* ware found further to the east. Wascana ware shared similar cord and fabric-impressed surfaces, thick walls, and coarse temper but differed from Ethridge ware because some vessels displayed check-stamped surface finishes and more decorative elements (Kehoe 1959). Malainey (1991) revitalized the Wascana ware term to describe the ceramics from the northern distribution of the Mortlach aggregate. However, Walde (2003:62) argued that these ceramics are Mortlach vessels and should be part of the Lozinsky Subphase which represents components that have mixed Mortlach and Selkirk assemblages.

Detailed systematic excavations became more frequent in the 1960s with funding from the Glenbow Foundation in Alberta. Archaeologists followed Kehoe's (1959) classification and vessels recovered from the Ross Site and the Grassy Lake Carin were included within the Ethridge ware classification based on similar descriptions from the Ethridge and Galata site collections (Forbis 1960; Wormington and Forbis 1965; Griffin 1965). In 1970, Reeves completed his PhD dissertation which provided a broad culture-history for the Northern Plains from 1000 BC to AD 1000 (Reeves 1983). His research served as a model for future research and continues to influence modern interpretations (Vickers 1986; Peck and Ives 2001; Peck 2011).

Reeves' model of the Late Prehistoric Period (AD 200 to 700 to AD 1725), which includes the Avonlea and the Old Women's Phase, was relevant to the current study because of the increased frequency, or perhaps initial occurrence, of ceramic vessels on the Northwestern Plains. He suggested that the Besant and Avonlea archaeological cultures co-existed from 1750 to 1250 BP, after which the Old Women's Phase emerged from Besant. Avonlea was either displaced from the region or merged with Besant (Reeves 1983a:46-47). Evidence supporting this culture-history model is based on projectile points and other lithic artifacts in association with settlement and subsistence patterns related to bison hunting strategies (Reeves 1983a). Although he briefly mentioned ceramic attributes from specific sites, there was no attempt to classify pottery types. In fact, he did not reference Ethridge ware or Kehoe (1959).

Byrne (1973) completed a detailed analysis of ceramics recovered from 143 sites from southern Alberta, many of which were from private collections and lacked stratigraphic contexts. He analyzed the sherds by attribute and organized them using a

combination of hierarchal and analytical approaches suggested by Rouse (1960, 1972), dividing them first into classes based on paste and surface finish, followed by vessel portion, and a numerical value representing other unique characteristics (Byrne 1973:29-32). A total of 318 codes were used, 214 of which were rim descriptions. He later sorted the sherds into vessels for ease of comparison. The large ceramic assemblage of 71 vessels from the Morkin site was used in conjunction with relative stratigraphic and radiocarbon dates to temporally classify the modes of attribute features (Byrne 1973:298). By comparing the mode frequencies from Morkin with 18 other sites with stratigraphic contexts, two separate pottery complexes were distinguished: the Saskatchewan Basin Complex and the Cluny Complex (Byrne 1973).

The Saskatchewan Basin Complex was divided into Early and Late Variants, which corresponded to Reeves' (1983) shift from Besant and Avonlea to the Old Women's Phase, emphasizing the continuity of the Avonlea ceramic tradition. The Cluny complex represented an intrusive ceramic tradition related to the Middle Missouri area. Byrne (1973:298) divided the temporal divisions into Period I (AD 150-250 to AD 1150) linked with Avonlea components, Period II (AD 1150 to AD 1700) with Old Women's Phase components, and Period III (AD 1700 to AD 1870) with the Old Women's Phase, Cluny, and Protohistoric components. A total of 13 persistent modes, four partial sequences, and five transitory modes were identified for the Saskatchewan Basin Complex, which varied in frequency throughout all three time periods (Byrne 1973:341-356). Modes of the Late Variant of the Saskatchewan Basin Complex were cord-marked and smooth surface finishes, distinct neck and complex wall profiles, and flat and thickened lips. Though uncommon, decorative modes were found on the lip, outer lip

edge, neck, and shoulder and consisted of punctates, perforations, finger pinching, and impressions made with a plain or cord-wrapped tool. Similar modes occurred in the Early Variant, except that they were simple and coconut formed vessels with a higher frequency of fabric or net impressed surface finishes (Byrne 1973:355-356). Cluny Complex modes were distinctly different than the Saskatchewan Basin Complex variants, exhibiting grooved paddle impressions, collared and braced rim forms, dentate stamping, and brushing (Byrne 1973:357).

Although only sites from southern Alberta were used in his analysis, some collections outside the province were also noted as being similar to the Saskatchewan Basin Complex: Late Variant, including the Ethridge and Galata sites in Montana, and the Walter Felt site in Saskatchewan (Byrne 1973:385-387, 405-406). Similarities with Moose Jaw Cord-Marked vessels and some Mortlach pottery from the Mortlach site, as described by Wettlaufer (1955), were also noted (Byrne 1973:394-395).

Although he recognized overlapping attributes, Byrne (1973:386) did not follow Kehoe's (1959) model for Ethridge ware. He disagreed with the theoretical culture-history of the Pisamiks Tradition because it linked Cluny pottery and the Saskatchewan Basin Complex: Late Variant. Byrne (1973:527) criticized Kehoe's theory as "not able to distinguish between certain chronologically and typologically distinct collections, and as a result this complex combines traits actually representative of two or more pottery manifestations". Since the culture-history of Kehoe's Ethridge ware was fundamentally different from what Byrne was interpreting from southern Alberta, he had no alternative but to create his own terminology. Furthermore, Byrne (1973:486-487) emphasized that people from northern Montana were only connected to areas north of the Missouri Coteau

after the introduction of the horse in the Protohistoric Period. Keyser (1980) later debated this theory by arguing that the ceramic collections in the Fresno Reservoir area in northern Montana are related to the Saskatchewan Basin Complex: Late Variant.

Archaeological assessments shifted to follow Byrne's (1973) model. Major ceramic classes were often used to identify surface finish and paste from newly recovered ceramic artifacts. Form and decorative elements were also described in reports, but discussions about the context of the attributes were less common. Ceramics from Saamis (Milne Brumley 1978) and Ross (Vickers 1989) were grouped into classes, described in detail, and then defined as Saskatchewan Basin Complex: Late Variant. Ceramic analyzes described this way led to the adoption of the Saskatchewan Basin Complex: Early and Late Variants as ceramic types, rather than Byrne's (1973) original analytical method of identifying modes through space and time. This was likely caused by the inherent desire to summarize and simplify ceramic descriptions for easier communication.

Archaeologists have continued to refine the characteristics of the Old Women's Phase and associated ceramic artifacts. Brumley and Dau (1988:51) contributed by defining the Old Women's Complex as components having Prairie or Plains Side-notched projectile points in association with Saskatchewan Basin Complex: Late Variant ceramics which emerged only from Avonlea. Meyer (1988) provided a summary of evidence that denoted that the early portion of the Old Women's Phase extended into Saskatchewan. Old Women's Phase components were recognized at Saskatchewan sites including Garratt, Tschetter, Newo Asiniak, Lucky Strike, Morris Church, Walter Felt, Gull Lake, and potentially the Mortlach site, though these components did not necessarily have associated ceramics (Meyer 1988). Most of the components dated from approximately

AD 800 to 1300; the Moose Jaw cultural material from the Mortlach site was the only contender for components after AD 1300. Expanding on the Saskatchewan Basin Complex: Late Variant descriptions, the vessels from Saskatchewan were noted to be "globular, with rounded or occasionally flattened bases" (Meyer 1988:56).

More recently, there has been a tendency to link Saskatchewan Basin Complex: Late Variant and Ethridge ware together, suggesting that they represent the same ceramic type (Green 1993; Meyer and Walde 2009; Walde and Meyer 2003). Furthermore, since the distribution of the Avonlea and Old Women's Phase ceramics has now been confirmed south of the Missouri Coteau in northern Montana, Walde and Meyer (2003:134) encouraged a return to the use of Ethridge ware, not only because of precedence, but to emphasize the use of one particular ware in two overlapping but distinct archaeological manifestations, starting in Avonlea and continuing into the Old Women's Phase (also see Johnson 1988; Quigg 1988; Walde 2006c).

Meyer and Walde (2009:62-63) provided the most recent interpretation of Ethridge ware. Ceramic attributes remained similar to those previously described by Kehoe (1959) and Byrne (1973) but the distribution was refined. Vessels from the Upper Kill and Corey Ranch sites, described as having thick walls and complex profiles, were found with Avonlea style projectile points (Quigg 1988). Meyer and Walde (2009:62) reported that a number of Avonlea assemblages from northern Montana and adjacent southern Alberta include pottery similar to that from the Corey Ranch site. This account, along with finds from the Upper Kill site (Forbis 1960; Wormington and Forbis 1965) and the Corey Ranch site (Quigg 1988) serve as evidence that Ethridge ware is associated with Avonlea components. Other sites have been suggested to be a transitional link

between Avonlea and the Old Women's Phase, though these lack associated ceramic artifacts (Adams 1977; Brumely and Dau 1988; Clarke 2000; Hudecek 1989; Peck 2011).

Despite efforts to classify these vessels into distinct typological entities, researchers continue to struggle with their classification. This may be because there is significant variability in assemblages, but also because of the ambiguity in the terms used. The result is that many of the ceramic vessels found within Old Women's Phase contexts are simply referred to as Old Women's Phase pottery (Loveseth 1982; Peach et al. 2006; Whatley 2004).

The increasing variability seen in Old Women's Phase pottery sparked new theories of ceramic types. Walde (1999) and Walde et al. (2010) proposed the assignment of the *Hunter Valley Edge-Paddled* type to vessels with large impressions on the surface, likely from the side of a cord-wrapped paddle, originally identified at the Hunter Valley site. These impressions were considered a decorative element to distinguish them from the manufacturing technique. At first, Walde (1999:235) compared these vessels to Sandy Lake ware and suggested a new archaeological phase based on the distinct style. He has since identified similar vessels at other sites, including EkPf-1 (Rumsey Cairn) and EfPk-1 (FM Ranch Campsite) and rather than a different phase, a new ceramic type was proposed (Walde et al. 2010).

Walde (2006a) has also suggested the *Little Bow Short Rim* and the *Junction Narrow Lip* types which are differentiated by the metric attributes of the rim portions. The Little Bow Short Rim type was identified from a series of sites along the Little Bow River. These vessels are described as homogeneous in style with rim heights ranging from 9-13 mm and lip thicknesses from 10.5-16 mm. These vessels tend to be slightly

older than the Junction Narrow Lip type, which was based on 15 vessels found in Component I from the Junction site along the Oldman River. He suggested that this type represented a time period in which the Old Women's Phase, One Gun, and Mortlach populations were interacting. Vessels assigned to the Junction Narrow Lip type have rim heights ranging from 17-34 mm and lip thickness from 6.5-10.5 mm. The surface finishes range from cord-roughened to smooth, check-stamped, and fabric-impressed. With the recognition of these distinct ceramic types, Walde (2006a:104) suggested future research focus on redefining the Old Women's Phase.

Current Study

The increased number of ceramic artifacts recovered in transitional Avonlea and Old Women's Phase contexts provided an opportunity to use the ceramic dataset to evaluate the typological classification of these artifacts. The aim was not to evaluate the culture-history models, but rather to analyze the ceramic attributes in order to assess the typological classifications that have been used as evidence for these models. By focusing the analysis of vessels that have been referred to as Ethridge ware, Saskatchewan Basin Complex: Late Variant, and Old Women's Phase pottery, the objectives of this research were to:

1. Provide an updated description of pottery from this time period;
2. Determine whether or not there is enough attribute consistency between the analyzed vessels to include them in a typological group or groups; and
3. Assess whether regional and temporal patterns can be identified within the vessel attributes over the 1000 year time span.

It was hypothesized that clusters of attributes would be identified enabling the refinement of the spatial and temporal distributions from southern Alberta, Saskatchewan, and northern Montana. The goal was to provide opportunities for future culture-history studies and encourage exploration to further understand the individual choices that artisans made within their cultural sphere.

CHAPTER 2: Methodology

This study involved data collection, ceramic attribute analysis, and typological classification. The methods used for each of these steps are described below.

Data Collection Methods

Data collection involved determining which assemblages to use, organizing the contextual data, and recording sherds and vessels.

Determining Site Collections

In order to determine which collections to analyze, a list of all archaeological sites containing pottery or ceramic artifacts from Alberta, Saskatchewan, and Montana were obtained. Based on the Alberta archaeological site data inventory obtained on February 17, 2013 from the Archaeological Survey of the Historic Resources Management Branch, 1001 Alberta archaeological sites have ceramic artifacts. The inventory of Saskatchewan archaeological site data obtained on January 23, 2013 from the Heritage Conservation Branch of Saskatchewan Parks, Culture and Sport, listed 792 archaeological sites where ceramic artifacts were collected or observed. The data contained site form information that was not always consistent.

Both Alberta and Saskatchewan lists were filtered for sites that mentioned “Old Women”, “Old Woman”, “Late Variant”, “Late Varient”, “Ethridge”, “Etheridge”, and “Prairie” or “Plains Side-notched” to accommodate for the most common spelling errors. Sites that had been previously studied or discussed by Byrne (1973), Forbis (1960), Kehoe (1959), Peck (2011), Meyer (1988), Meyer and Epp (1990), Meyer and Walde (2009), Walde (2006), and Wedel (1951) were also selected. Sites without geographical

coordinates were removed and sites with associated radiocarbon dates were prioritized. Once filtered, there were a total of 163 sites from Alberta and 55 from Saskatchewan that recorded the presence of Ethridge ware, Saskatchewan Basin Complex: Late Variant, or Old Women's Phase pottery. The large Alberta dataset could be representative of the true distribution of the artifacts, however, it is likely that more sites in Alberta have been identified due to the number of archaeological investigations resulting from urban development and industry. As industry increases in Saskatchewan, it is likely that more Old Women's Phase sites with ceramic artifacts will be found.

A list of Montana archaeological site data was obtained from the State Historic Preservation Office on September 13, 2012. This document listed 1094 sites, but did not provide details of the artifacts recovered. A second document was received listing 90 literature references that related to ceramic artifacts in Montana. It was decided that the resources available for the current project could not accommodate personal examination of assemblages from the sites in Montana, and data were only used if the report provided detailed information about the ceramic attributes. Collections from six Montana sites were used in this study.

The ideal method for selecting data would have been a random spatial sample from multiple time periods. However, archaeological data are not always collected evenly over large areas. Furthermore, not all of the 218 site collections from Alberta and Saskatchewan were accessible. Many of these collections are stored in private collections and accessing these was beyond the resources available for the project. It is best to assess the collections physically in order to maintain observation and interpretive consistency.

Requests to examine the ceramic collections of the identified sites were sent to the major repositories in Alberta and Saskatchewan. Collections housed at the Royal Alberta Museum, University of Calgary, Royal Saskatchewan Museum, University of Saskatchewan, the Provost and District Museum, and the Bodo Archaeological Centre were physically examined and added to an Access Database from June 17 – August 26, 2013. A total of 20 Alberta collections were examined and seven from Saskatchewan. Several vessels were confined to displays and were assessed by visual interpretation only. After the available ceramic artifacts were exhausted, additional data were added from the ceramic descriptions in published literature; 31 site collections from Alberta, 10 from Saskatchewan, and six from Montana were used in this study.

Comparing catalogues, reports, and photographs of different quality introduces some degree of error into the overall assessment of the material. Only publications with clear photographs or detailed attribute descriptions were added to supplement the data. Overall, the quality of reporting has been adequate to provide associated context with general ceramic attributes such as surface finish, form, and decorative elements present in the assemblage.

To summarize, collections were chosen based on site form data, artifact availability, and quality of documentation. All Montana collections used in this study are based on published literature.

Determining Temporal Distribution

Archaeologists use both relative and absolute dating methods to determine the age of the site or occupation level. When resources are available, radiocarbon dating is often the preferred technique. Ideally, material would be obtained from carbonized residues

from the interior of vessels, as was done for the Hunter Valley site and EkPf-38. All dates should be adjusted for errors. The Little Bow site dates, for example, averaged to approximately 500 BP because the upper component dated older than the lower component. Moreover, a radiocarbon date must always be interpreted and not directly associated with the other cultural material.

When absolute dating methods are not available, the most common relative dating method used in the Northwestern Plains archaeology is projectile point typology. Forbis (1962:95-203) created one of the most divided typologies using the side-notched projectile points from the Old Women's Buffalo Jump, and included Late Prehistoric Period Washita, Pekisko, Paskapoo, Nanton, Lewis, Irvine, and High River points. Kehoe (1966) simplified his typology and grouped the arrow points into Avonlea (AD 210 to 700), Prairie Side-notched (AD 700 to 1500), and Plains Side-notched (AD 1500 to 1773). This taxonomic scheme is the most commonly used in the Northwestern Plains and provides archaeologists with a temporal indicator to cross-date other artifacts within associated contexts. Peck and Ives (2001) reduced the Prairie and Plains Side-notched types into the *Cayley series* in order to emphasize the continuity and similarities of the two.

For ease of comparative analyzes, the dates associated with the ceramic artifacts were summarized and averaged based on the absolute and relative dating methods employed by previous researchers. The averaged and approximate date was used to compare attribute frequencies. Systematic temporal categories were created to present the data more generally. These are based on the commonly used projectile point transitions as defined by Kehoe (1966). These categories are not intended to define cultural phase

categories, but only to assess the temporal context of Old Women's Phase pottery. The results of this analysis may conclude that these divisions are insignificant. The Early Period (1220 to 700 BP) is based on the Avonlea and Old Women's Phase transitional period as well as the occurrence of Prairie Side-notched projectile points. The Middle Period (700 to 400 BP) is based on the occurrence of Plains Side-notched projectile points. The Late Period (400 to 150 BP) also represents the occurrence of Plains Side-notched projectile points but has been created based on the beginning of the Protohistoric Period.

Sherds and Vessels

Data acquired from the physical analysis of the artifacts were first recorded by sherd and catalogue number. Many sherds had been glued together and were therefore analyzed as one entry. The weight of each sherd entry was recorded to 0.1 gram. Each sherd was assigned a vessel number, maintaining consistency with previous analyzes when applicable. Sherds were considered to be from the same vessel if they refit or if there was consistency in the paste, thickness, and form. The sherd entries were eventually grouped into vessel lots and the range of attributes were summarized. Most vessels were based on the presence of a rim portion. However, when sherds had an identifiable feature, such as a decorative element, angled form, or a surface finish that could not be associated with a rim portion, they were assigned a vessel number. When there was an abundance of non-diagnostic sherds associated with a vessel, a sample from the collection was recorded. By recording the data this way attributes were able to be analyzed at a finer scale.

Ceramic Attribute Analysis

The method used to analyze the ceramic attributes was based on the methods used by previous researchers (Kehoe 1959; Byrne 1973; Malainey 1991; Paquin 1995; Walde 2003; Young 2006). Methods of recording attributes were adapted from these studies to maintain consistency and allow for comparative studies. The following sections provide detailed descriptions of how each attribute was analyzed.

Manufacturing Methods

There is no consensus regarding the construction techniques of Plains pottery. Kehoe (1959:240) first described the construction for Ethridge ware as the "patch method", suggesting that slabs of clay were being joined together and shaped using a paddle and anvil. Using ethnographic information and experimental techniques, Simon (1979:59) concluded that the vessels assigned to the Saskatchewan Basin Tradition, including both Avonlea and Old Women's Phase vessels, were constructed using a ground mould. She based this on the fact that decorative elements are usually only found above the shoulder of the vessel, which is the part exposed above the ground (Simon 1979:51). The texture on the exterior body of many vessels was thought to be from the loosely woven fabric used to line the ground mould in order to allow the vessel to be removed more easily (Simon 1979:53). Her interpretations have been met with some criticism based on the unreliability of ethnographic documents and frequent occurrence of cord-wrapped paddle impressions on the exterior surfaces (Byrne 1973:509-510; Peck 2011:378). The most commonly suggested manufacturing technique is the use of a paddle and anvil, often with the paddle being wrapped with some type of cordage (Kehoe 1959; Byrne 1973; Peck 2011:378). However, using a loosely woven sprang bag would

ultimately leave the same evidence on the surface as a cord-wrapped paddle. Textile bag moulds are thought to be the method that was used to make the Selkirk composite pottery types from sites to the north (Paquin 1995; Young 2006). These vessels have very thin walls and the bags would have provided extra support to prevent the vessels from slumping. Thicker walls would have been required to support a vessel that was free-standing.

The initial intention of this study was to record the method of manufacturing. It was soon realized that vessels made using a paddle and anvil were very similar to those made using a textile mould. Differentiating between these manufacturing techniques was not possible. Further technological studies should be conducted prior to including this component into a typological study. Environmental firing conditions, paste quality, temper size and density, and hardness were recorded which may have the potential to aid in future studies on the manufacturing and functional aspects of Northwestern Plains ceramics.

Surface Finish

Surface treatment can represent both stylistic choices and functional use (Syms 1977:62-62). A rough, textured surface can improve cooking properties by providing more surface area to absorb heat (Herron 1986; Rice 1987:232). This functional approach may explain the high frequencies of roughened surfaces in the Northwestern Plains.

Common surface finishes that have been previously documented on Old Women's Phase ceramics include cord-roughened, textile impressed, and smoothed (Kehoe 1959; Byrne 1973; Walde and Meyer 2003). Most cord-roughened surfaces were vertically oriented and were noted as such. However, if the linear surface finish was partially

smoothed or too little of the vessel was present to determine orientation, the finish was described as general cord-impressed. Knotted cord-impressed surfaces have clear dimples along a linear cord orientation. Textile impressed surfaces display the marks of a woven pattern with impressions of the warp and weft present, probably a twinned fabric. The dimpled surface finish is likely the same as what Byrne (1973) referred to as Fabric/Net Impressed, which dominates Avonlea assemblages. To avoid any technological assumptions, the term dimpled was used to describe the random pattern of small, round to oval impressions. Other surface finishes included finger-tip impressions (large, overlapping oval impressions), check-stamped (sets of shallow impressions, groves, or ridges likely left by a carved paddle), and brushed (fine, linear incised lines). Smoothed finish was selected if no texture was seen on the surface. This could have been the result of no texture present at all or texturing had been completely obliterated by smoothing. A general roughened category was used to group any finish that was not distinct enough to confidently place it into one of the defined surface finish types. This was often associated with partial smoothing. Examples of surface finishes are presented in Figure 2. Milne Brumley (1978:197) provided an example of Finger-tip impressions found in from the Saamis site.

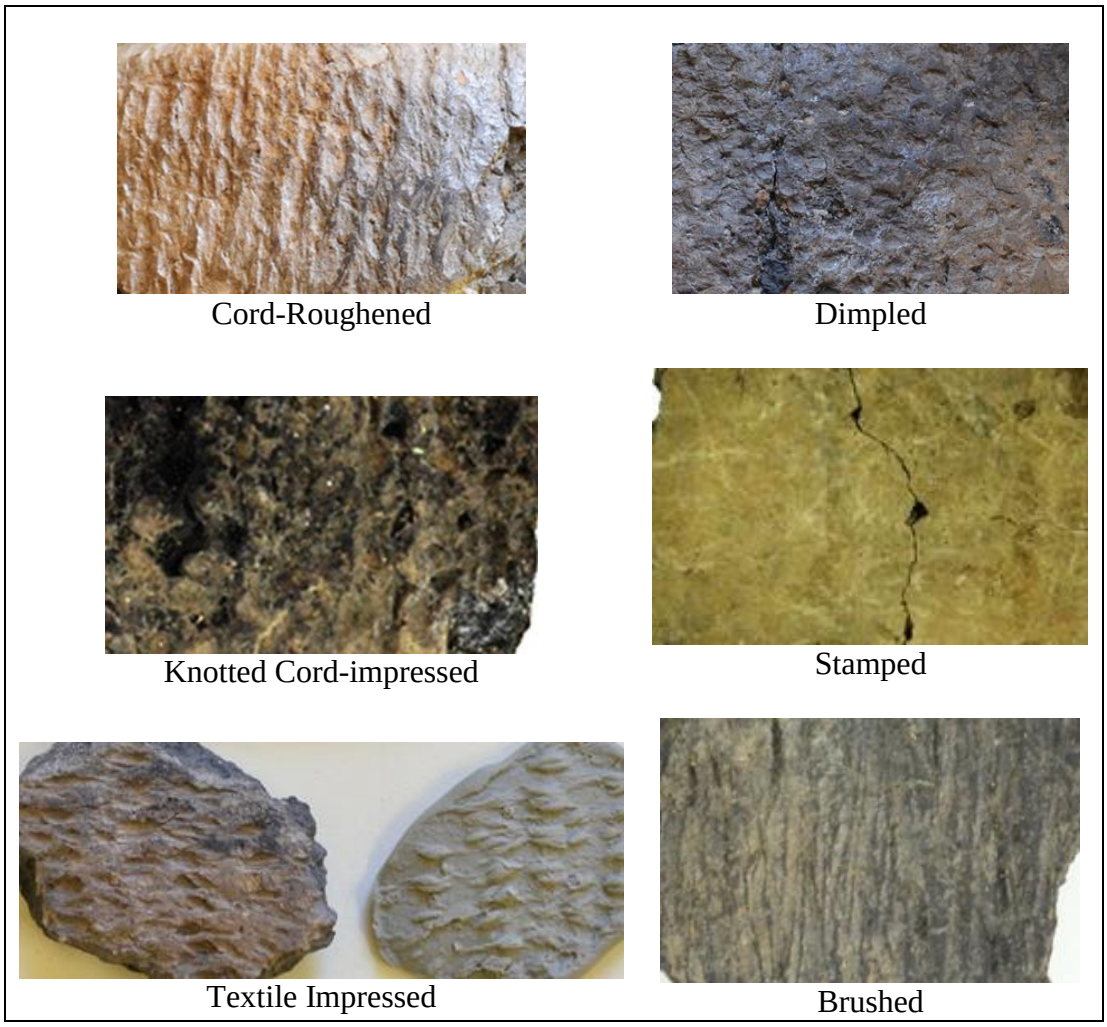


Figure 2: Examples of distinct surface finishes.

The width and space between the impressions were recorded to the nearest 0.1 mm when possible. The twist direction of the cordage was also recorded when it could be determined. The depth of the texturing ranged significantly in different areas of the vessels. It was determined that the best way to record this attribute was qualitatively. Surface finishes were recorded as light, medium, and deeply impressed into the wet clay. If there was any evidence of smoothing of the textured surface, it was referred to as partially obliterated (Table 1).

Table 1: Quality of surface finish.

Depth of Surface Treatment	Description
Light	Less than half the cord was impressed into the clay.
Medium	Half the cord was impressed into the clay.
Deep	The cord was pressed deeper into the clay than half of the cord's width.
Partially Obliterated	The impressions were partially smoothed away while the clay was still wet.

Fabric – Paste and Temper

The fabric of the vessel consists of the paste and temper. Paste characteristics may represent of the amount of compression that took place during the manufacturing process and the raw clay composition. The paste was described as blocky, laminated, compact, or a combination of these based directly from Byrne (1973:30) (Table 2).

Table 2: Paste texture categories.

Texture	Description (from Byrne 1973:30)
Blocky	The broken edge of the sherd appears to be irregular, with numerous humps and hollows where clumps or blocks of fired clay have broken off.
Laminated	The sherd tends to split through one or more visible planes which lie parallel to the vessel surface.
Compact	The broken edge of the sherd tends to be straight and clean, with no evidence of blockiness or lamination.

The term "temper" can be used as both a noun referring to the additive components to the clay paste or as a verb describing the action of adding material to the paste (Rice 1987:406-407). For the purposes of this project, temper is defined as the non-plastic component that is deliberately added to clay to change its properties. Temper can alter the consistency of the clay, reduce shrinkage when drying and heating, increase the strength of the finished piece, and lower the temperature needed to reach the verification point (Rice 1987:408). Variation in temper type and size may reflect a potter's preference, function, or other cultural choices and is indicative of raw material acquisition. Kehoe (1959:241) suggested that temper was naturally occurring in the clay

sources from the Northwestern Plains, but Bower (1973) concluded that the combination of angular granitic stones, such as quartzite, feldspar, and mica, mixed with smoothed and weathered materials implies the deliberate addition of the angular components. Gilmore (1925:286-87) reported on ethnographic documents that described Arikara women from the Upper Missouri River area crushing heat treated granite cobbles to be used as temper and Ewers (1945:291) noted that pottery was made with "pulverized stones".

It is also possible that potters used organic tempers, such as seeds, grasses, and dung, in combination with the inorganic materials. Organic tempers can improve the workability and increase strength but usually burn out leaving hollow pores in the finished pieces. Due to the amount of naturally occurring organic material in clays from the Northwestern Plains, it is difficult to identify whether organic components were deliberately added.

Although it was not within the scope of this project to conduct a detailed temper and petrographic analysis, general temper characteristics were recorded. Common inorganic tempers such as quartzite, feldspar, and mica were noted, or when all three appeared in the same sherd, were simply referred to as granite. Sand and lithic tempers were also noted when observed as these have been identified in other northern Plains vessels. The maximum size of inorganic temper was measured to the nearest 0.1 mm. Minimum size was not recorded because they were too small to measure. The density of the inorganic temper in relation to the paste was measured as a percentage based on the figures in the Munsell charts. Organic temper was only noted when distinct hollows were present.

Vessel Form

Vessel form is typically associated with the function of pottery vessels (Rice 1987:215). The round, globular shape of Old Women's Phase pottery and the carbonized residue in the interior surfaces has provided evidence that these are utilitarian cooking pots (Kehoe 1959:240). According to Rye (1981:27), round-bottomed vessels with smooth contours are more resistant to thermal stress when cooking because of a more even heat distribution. Vessel thickness can also reflect its function: thicker walls tend to resist physical stress easier and thinner walls conduct heat faster (Henrickson and McDonald 1983:631; Rice 1987:227). Inconsistencies in shape and thickness within the individual pot may suggest a different use than cooking, varying levels of attention to detail when making these vessels, and the importance of these attributes to particular populations.

Form was assessed by dividing the vessel into separate portions including the lip, rim, neck, shoulder, body, and base (Figure 3). This allowed for similar portions to be compared together.

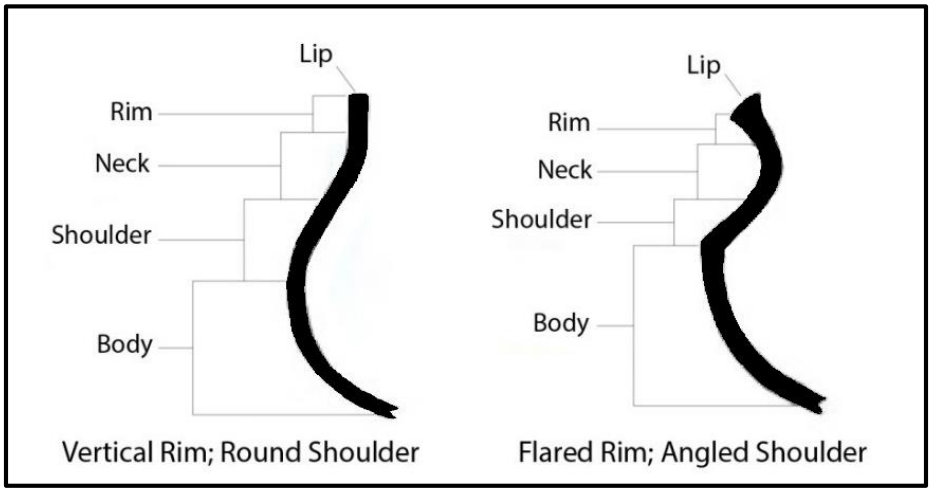


Figure 3: Vessel portion locations.

Lip - The lip consists of the terminal surface of the vessel and is considered a feature of the rim (Figure 3). The top surface and inner and outer corners of the lip often are inconsistent in form, even within the same vessel. Walde (2003:12) did not use the lip shape as a comparative attribute when analyzing Mortlach ceramics due to this high variability. Recognizing this complication, lip shape was classified using an adapted methodology form Byrne (1973), Paquin (1995:35), and Young (2006:35) (Table 3, Figure 4). These profile forms were combined when necessary, such as exterior expanding with exterior beveled. The minimum and maximum lip thicknesses were recorded to nearest 0.1 mm.

Table 3: Lip profile descriptions.

Type	Description
Square	The lip is flat with sharp corners.
Round	The lip forms a convex surface with no bulging at the sides.
Subround	The lip is flat with rounded corners.
Tapered	The lip gradually thins towards a point or flat surface.
Beveled	One of the lip corners is higher than the other. This category was divided into interior and exterior beveled.
Expanding	One or both of the lip corners gradually expand outwards. This category was divided into interior or exterior expanding, or both.
Flanged	One or both of the lip corners abruptly turn outwards. This category was divided into interior and exterior flanged.

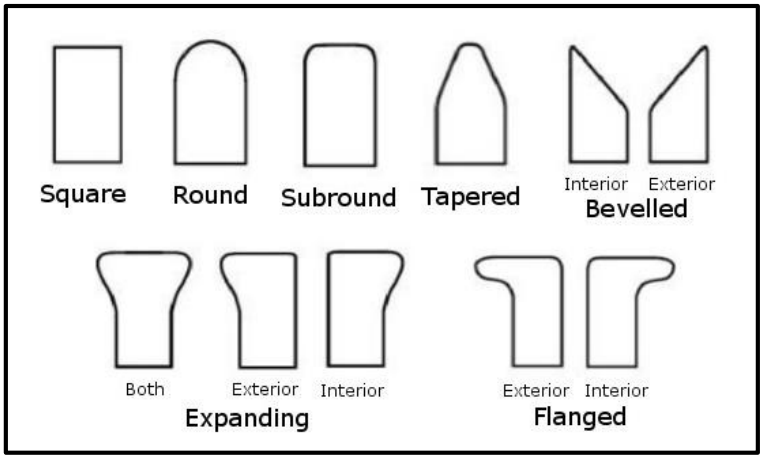


Figure 4: Lip profiles.

Rim - The rim is the portion of the vessel closest to the opening. It contains the lip and extends down until the neck begins to form a concave shape (Figure 3). Rim profiles were only identified if enough of the vessel was present to determine orientation. Categories were created by combining the rim profile definitions of Malainey (1991:39-42), Walde (2003:10-11), and Paquin (1995:37-38) with those described by Byrne (1973) (Table 4). The minimum and maximum thicknesses of the rim were measured to the nearest 0.1 mm; however, because the location measured varied from vessel to vessel, and even sherd to sherd, these data are inconsistent and cannot be directly compared.

Table 4: Rim profile descriptions.

Type	Description
Vertical	The rim is generally straight and oriented in a vertical direction.
Flaring	The rim has a distinct outward curve.
Constricted	The rim has a distinct curve towards the inside of the vessel and does not display evidence of a constricted neck.
Angled	The rim flares out from the neck and then angles back inward.

The rim diameter was recorded alongside the profile form. The former was determined using the standard diameter-measurement template found in Sutton and Arkush (2006:120). The percentage of the rim present was also recorded. The length of the rim was measured from the top lip to the spot where the neck begins to curve. If the rim was flaring, the angle was determined by how many degrees the mid-point of the wall was angled away from the vertical position.

Neck - The neck is the most constricted portion of the vessel and is situated between the shoulder and rim (Figure 3). It begins where the angle starts to form a concave shape. The neck terminates at the mid-point between the narrowest and the widest part of the vessel profile. When the complete neck profile was present, the length was recorded to the nearest 0.1 mm. The angle of the curvature was measured from the

exterior surface and measured in degrees. Similar to the rim portion, the minimum and maximum thicknesses of the neck were recorded to the nearest 0.1 mm, but the location measured varied making this attribute inconsistent.

Shoulder - The shoulder is the portion of the vessel with the widest diameter and displays a convex shape (Figure 3). It begins where the neck terminates and ends at the widest part of the vessel profile. Shoulder profiles were classified as round, angled, or none when there was no distinct shoulder. The angle of the shoulder was measured from the exterior surface and recorded in degrees. The minimum and maximum thicknesses of the shoulder were recorded to the nearest 0.1 mm. This measurement was more reliable than the rim and neck thicknesses because it was taken at the widest portion of the vessel.

Body – The body is the portion that makes up the majority of the vessel. It begins directly below the shoulder, where the profile gradually begins to slope downward, tapering towards the base (Figure 3). It is difficult to identify what area of the body the sherd came from unless a large enough portion is present. The minimum and maximum thicknesses were recorded to the nearest 0.1 mm, but the inconsistent location also prevented detailed analysis.

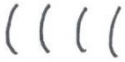
Base – The base is the portion of the vessel that comes into contact with a grounding surface. Round bases can be stabilized with additional supports. Bases were classified as either round, flat, or tapering. The preservation of the base portion is usually poor due to internal and external abrasions on the surfaces. Minimum and maximum thicknesses were also recorded to the nearest 0.1 mm, but as with other locations, they are inconsistent.

Decoration – Stylistic Attributes

Decorative elements are considered part of the embellishment process after the vessel was formed into its final shape (Rice 1987:144). Whether decorative elements were used to intentionally express social and/or group identity or if the variation between elements resulted from unintentional learned behaviour is unclear (Sackett 1977, 1985; Wiessner 1983, 1985). The presence of particular decorative elements was recorded to determine the relationships between these elements and other attributes.

A variety of decorative elements are found on vessels from the Northwestern Plains (Table 5). The most common examples of decorative elements from published literature include cord-wrapped tool (CWT) impressions, punctates, incised lines, finger impressions, and fingernail notches (Byrne 1973; Kehoe 1959; Meyer 1988; Walde and Meyer 2003; Wedel 1951). Their presence was recorded in the database.

Table 5: Decorative elements identified in this study.

Example	Element	Description
	Punctate	A solid round, blunt object impressed into the exterior surface of the wet clay often causing the interior surface to be pushed out, creating a boss.
	Hole	A punctate that has pierced through the wall of the vessel.
	Tiny Punctates	A set of small impressions made with a small, thin tool without going completely through the vessel wall.
	Irregular-shaped (Irreg.) Punctate	A punctate with an irregular shaped tool.
	Hollow Impression	A round, hollow object pressed into the wet clay surface leaving a circular impression.
	Cord-Wrapped Tool (CWT) Impression	A single cord has been wrapped around a thin, straight object and pressed into the wet clay surface. The direction of the cord twisted around the tool was recorded when possible.
	Cord Impression	A single twisted cord is pressed into the wet clay surface.
	Finger Pinch	Small portions of the clay are squeezed between two fingers forming a ridge of clay. Finger nail marks can often be seen on the pinched portions but this is not always the case.
	Finger Impression	The tip or the pad of the finger is pressed into the clay causing the surrounding material to rise around it.
	Fingernail Impression	A fingernail is pressed into the wet clay leaving a crescent shape impression. This technique may also cause a gouge made by the finger nail.
	Incised Line	A solid, usually sharp tool scraped across the surface of the wet clay.
	Linear Impression	A flat, straight object pressed into the surface of the wet clay.
	Angular Impression	The side of an angled object pressed into the wet clay.
	Dentate	A straight object with grooves or notches cut along the flat edge pressed into the wet clay leaving marks that can look like teeth impressions.
	Gouge	A thicker tool scraped across the surface, removing clay.
	Boss	An addition of clay to exterior surface or a punctate pressed into the interior surface leaving the exterior surface bulging.
	Paddle-Edge	Large CWT impressions on the body and neck of the vessel, likely from the side or edge of a cord-wrapped paddle.

Element Orientation and Measurements

As with decorative elements themselves, the orientation and placement of the elements may represent personal choice or conforming to traditions of the group (Wiessner 1983). Patterns can be displayed through the orientation, quantity, and position of the decorative elements. Table 6 lists the possible orientations of the decorative elements. Each decorative element is associated with one of the orientation descriptions. These terms have been adapted from Malainey (1991:50-53) and Walde (2003:15-17).

Table 6: Orientation of decorative elements.

Orientation	Description
Horizontal	The element is arranged horizontally on the vessel.
Vertical	The element is arranged vertically on the vessel. Decorative elements that are perpendicular to the lip surface have also been labeled as vertical.
Right Oblique	The element is arranged from the lower left to the upper right.
Left Oblique	The element is arranged from the lower right to the upper left.
Canaliculate	The element is on the lip surface, parallel to the lip circumference.
Zig-Zag	The element is in a series of peaks above and below an imagined horizontal straight line.
Interlocking	The element alternates around the vessel in a zipper-like pattern
Cross-hatched	Linear elements overlap with each other at multiple locations.

Metric data were also recorded to determine patterns and variation within individual vessels. These factors include the number of rows, the space between rows, the distance from the top of the vessel, and the average depth, height, and width of the decorative element impressions. Measurements were recorded to the nearest 0.1 mm.

Firing Conditions and Colour

The colour of the pottery can range significantly even within a single sherd. This is partly because of the uneven firing temperature, environment, the amount of carbonized organic material that was left unburnt in the clay paste, and the minerals in the clay itself. There is no evidence of kilns being used by Northwestern Plains groups.

Firing was restricted to open-pit firings and usually involved relatively low temperatures (Rice 1987:153; Sutton and Arkush 2006:114). The firing environments are often referred to as either oxidized or reduced. In an oxidized environment there is an abundance of oxygen to allow the carbon in the clay to burn away. Firing for long periods and reaching hot enough temperatures in an environment with good ventilation will allow all of the carbon to burn away from the clay, leaving it lighter in colour. Depending on the mineral content of the clay and the added temper, oxidization usually begins at temperatures ranging from 300-500°C and is typically completed at approximately 850°C. If the oxidization process was incomplete, the interior of the sherd in cross-section will be darker in colour than the exterior, leaving a dark core (Rice 1987:334-344; Sutton and Akush 2006:114). In a reduced environment, there is not enough oxygen to allow the carbon to combust; therefore it will remain in the clay leaving a dark uniform colour. In open-pit firings, typical for North American pottery traditions, a combination of reduced and oxidized environments were common because it is difficult to control the temperature and the surrounding atmosphere, with portions of the vessel coming into contact with the burning fuel (Sutton and Akush 2006:113-114).

Once fired, ceramic artifacts range in colour depending on the mineral present and their oxidized or reduced state. Sherds that are reddish or orange, for example, contain iron which becomes visible in an oxidized environment. Kehoe (1959:238) noted that Ethridge ware ranges in colour from grey through light brown to light reddish brown.

For this study, the interior, exterior and core colour of the cross-section of each sherd was recorded using the Munsell colour chart. If a carbon-rich core was visible, it was measured to the nearest 0.1 mm. However, since clay colour is not usually an

indicator of typology, these data were not analyzed in detail. It is available for future technological research.

Hardness

The hardness of sherds can indicate firing temperatures and conditions, types of clay, impurities in the clay, mineral components, and surface treatments (Rice 1987:354; Shepard 1956:114). Kehoe (1959:238) noted the hardness of Ethridge ware and stated that "it is usually about 3.5 on the Moh's scale". This measurement was compared to other pottery wares on the Northwestern Plains, particularly to Wascana ware, which was harder than Ethridge ware (Kehoe 1959:241). This method of measuring the hardness using the Moh's scale was used in this study.

Residue

It has been noted that the interior surface of many sherds have a carbonized residue leftover from use (Kehoe 1959:240). Although residue analysis was not carried out, its presence was noted. Gloves were worn when handling artifacts that had been wrapped in tinfoil to prevent contaminating any residue. Since many artifacts had been in storage or private collection for years, some residues had already been removed by earlier researchers or out-dated cleaning practices.

Recording and Analysis Methods

Ceramic attributes were recorded into an Access database which allowed them to be linked to site information such as UTM coordinates, site type, and temporal data. This database was able to be exported to Excel and SPSS formats for comparative and

statistical analyzes. The data were also imported to ArcGIS, which was used to analyze the spatial distribution of specific attributes and combinations. Several spatial statistics were explored.

CHAPTER 3: Site and Vessel Descriptions

Ceramic attributes from the late Avonlea and Old Women's Phase are best assessed within their associated contexts. Much of the data acquired for this study relates to previous research carried out on the sites from which the ceramics were collected. Details and summaries about the contextual information from the 47 sites are included in this study (Figure 5).

Antelope Creek – EeOc-2

The Antelope Creek site is located next to Lake Diefenbaker, which is a dammed reservoir on the South Saskatchewan River. The site was first recorded and surveyed by Henry Epp in 1971 (Millar et al. 1972). No systematic excavation has ever taken place. The assemblage is part of the private Heron Collection which was analyzed by Novecosky (2003).

The collection consists of Oxbow, Duncan, Hanna, Pelican Lake, Besant, Avonlea, Old Women's Phase, and Mortlach cultural material. This mixed surface assemblage prevents interpretation about artifact context, though Novecosky (2003) assigned 25 of the 78 vessels from the collection to the Old Women's Phase. Similarities between the Antelope Creek and Saamis site assemblages were noted (Novecosky 2003:56).

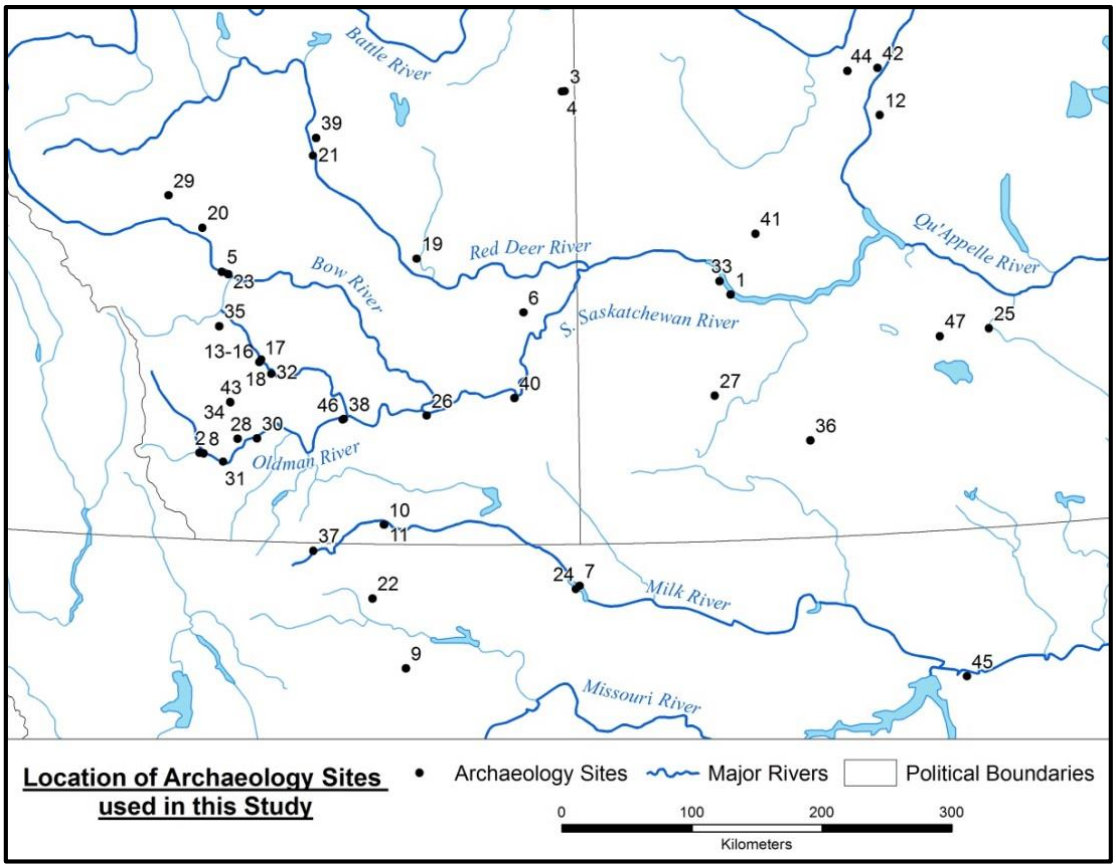


Figure 5: Locations of the 47 sites discussed in this study.

Map Legend

1 Antelope Creek – EeOc-2
2 Blakiston – DjPm-115
3 Bodo Bison Skulls – FaOm-1
4 Bodo Overlook – FaOm-22
5 Bridgewater – EfPl-34
6 British Block – EdOp-1
7 Cache – 24HL49
8 Castleforks Buffalo Jump – DjPm-126
9 Corey Ranch – 24TT83
10 DgPa-3
11 DgPa-4
12 Dundurn
13 EbPi-51
14 EbPi-52
15 EbPi-57
16 EbPi-63
17 EbPi-67
18 EbPi-73
19 EfOw-26
20 EgPm-82
21 EkPf-38
22 Ethridge
23 FM Ranch Campsite – EfPk-1
24 Fresno – 24HL103
25 Garratt Site – EcNj-7
26 Grassy Lake Cairn – DlOv-1
27 Gull Lake – EaOd-1
28 Head-Smashed-In – DkPj-1
29 Hunter Valley – EiPp-16
30 Junction Site – DkPi-2
31 Kenny – DkPk-1
32 Little Bow – EaPh-4
33 Miry Creek – EeOc-5
34 Morkin – DlPk-2
35 Old Women's Buffalo Jump – EcPl-1
36 Piche Pot – DkNv-15
37 Pouliot – 24GL1002
38 Ross – DlPd-3
39 Rumsey Cairn – EkPf-1
40 Saamis – EaOq-7
41 Sherwin Campbell – EgOa-5
42 Tipperary Creek – FbNp-1
43 Trout Creek Campsite – DlPk-3
44 Tschetter – FbNr-1
45 Twitchell – 24MC70
46 Upper Kill – DlPd-1
47 Walter Felt – EcNm-8

Novecosky's (2003) publication was the primary source of data for the current study (Table 7, Figure 6). The 25 vessels she assigned to the Old Women's Phase were used as the Antelope Creek sample. It is noteworthy that several vessels that Novecosky (2003) classed as Mortlach are very similar to other site assemblages used in this research. Vessel 38 is one such example and was included in the current database to compare characteristics with other assemblages in more detail.

Table 7: Vessel data from the Antelope Creek site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
5	VCR	Squared	Vertical		
6	VCR	Int. expanding, Ext. beveled	N/A		
7	VCR	Expanding (both)	N/A		
8	Roughened	N/A	N/A		
9	VCR	Int. expanding	N/A		
10	Roughened	Ext. beveled	Vertical		
11	Fabric Impressed	Expanding (both), Ext. beveled	N/A		
12	VCR	Ext. expanding	N/A		
13	N/A	Int. expanding, Ext beveled	N/A		
14	VCR	Ext. beveled	N/A		
15	Fabric Impressed	Expanding (both)	N/A		
16	VCR	Squared	Vertical		
17	Roughened	Squared	N/A		
18	VCR	Ext. expanding	N/A		
19	VCR	Expanding (both), Ext. beveled	Vertical		
20	VCR	Ext. beveled	Flaring		R: Incised Line
21	VCR	Expanding (both)	N/A		R: Finger Impr.
22	VCR	Ext. beveled	Vertical		R: Linear Impr.
23	VCR	N/A	Vertical		R: Angular Impr.
24	VCR	N/A	Vertical		L: Punctate
25	Roughened	Int. beveled	Flaring		L: CWT
26	VCR	Round	N/A		L: CWT
27	N/A	N/A	N/A		L: Dentate
28	VCR	Expanding (both)	N/A		L: CWT
29	N/A	Int. expanding	N/A		R: Linear Impr.
38	VCR	Int. expanding, Ext. beveled	Vertical	Round	

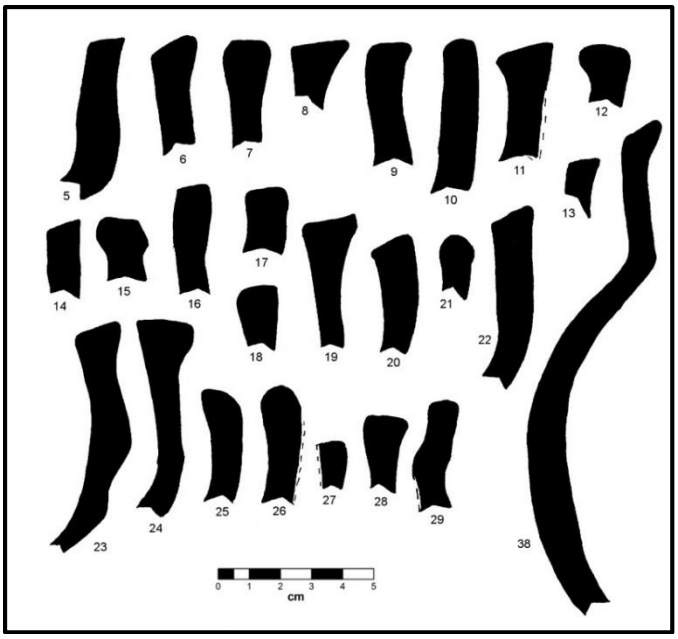


Figure 6: Rim profiles from the Antelope Creek site, adapted from Novecosky (2003:174-188).

Most of the identified vessels consist only of rim portions. Complete vessel form cannot be determined. Many of the vessels have a general tall, straight rim, which expands at the lip. Several vessel have a relatively abrupt neck angle. All of the decorative elements are oriented either vertically or at right oblique angles. Most of the vessels have girt temper except for Vessels 13, 19, 21, 26, and 29, which are reported to be tempered with sand (Novecosky 2003).

Blakiston - DjPm-115

The Blakiston site is an Old Women's multi-component stone feature and buried campsite situated southwest of the confluence of the Crowsnest and Oldman Rivers (Dau 1997:106, 117). Reeves (1987) first recorded the site in 1985 and extensive excavations took place in 1988-1990 to mitigate the impacts of the Oldman River Dam (Dau 1997).

The cultural stratigraphy of the site shows almost continued occupation for 750 years: the oldest radiocarbon date is 730±180 BP and the presence of metal objects

confirmed that the final occupation level was from the Historic Period (Dau 1997). Dau (1997:119) and Landals (1990) suggested that before this time, the flooding of the river did not allow for stability, and hence, campsites were located immediately to the west on a less prominent landform, site DjPm-114, during the Pelican Lake Phase. The Blakiston site was divided into cultural units from the Late Prehistoric Period (below 20 cm) and Protohistoric/Historic Period (0-20 cm) (Dau 1997: 281). Up to four separate occupation phases were identified in some of the numerous activity areas, making it difficult to determine how many times the site was used (Dau 1997:282). A total of nine stone circles, 20 hearth features, two cairns, and five pits were identified, along with lithic debitage, stone tools, ceramics, and bison, deer, and dog faunal remains (Dau 1997:124-125). Based on the large amount of foetal bone, tooth eruption data, some hearth features found within the stone circles, and the abundance of ceramic material, Dau (1997:282) suggested that the site was a long term winter campsite. Landals (1990:274) proposed that this campsite was used by the same people who utilized the Castle Forks Buffalo Jump, located a few kilometres to the east.

A total of 1125 ceramic sherds were recovered from the site, possibly representing up to 21 different vessels: 11 from the Late Prehistoric Period and 10 from the Protohistoric Period (Dau 1997:20, 284, 293). Ceramic artifacts were found throughout every occupation phase and styles remain relatively similar in both time periods. Local clay sources would have been easily assessable along the base of the terrace scarp (Dau 1997:307). Dau (1997:227-294) followed Byrne's (1973) typological system and classified all of the ceramics at the site as Saskatchewan Basin Complex: Late Variant based on the associated radiocarbon dates and surface finishes. Both truncated

fabric/net-impressed and brushed surface finishes were identified, though it was noted that the occurrence of these surface finishes did not correlate with the dates proposed for them since brushed finishes were thought to appear much later than fabric-impressed. However, Dau (1997:294) stated that "a more detailed study of the ceramics from DjPm-115 by researchers skilled in the study of Native Pottery would probably result in a different interpretation of the data".

A total of seven vessels from the Blakiston site were examined at the Royal Alberta Museum (Table 8, Figure 7). Vessels 1 – 4 were recovered from the fieldwork reported by Dau (1997). Vessel 5 is currently on display in the galleries and its context is unclear. Vessels 6 and 7 lacked rim portions so profiles were not drawn. These were distinguished as separate vessels based on their proveniences.

Table 8: Vessel data from the Blakiston site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Base	Decorative Elements by Portion
1	VCR	Int. flanged	Collared	Angled		L: CWT; R: Pinch
2	VCR	Int. flanged	Collared	N/A		L: CWT; R: Pinch
3	Roughened	Ext. beveled	Vertical			L: Dentate
4	Roughened	Ext. expanding	N/A			
5	Dimpled	Expanding (both)	Flaring	Round	Round	R: Hole
6	VCR		N/A	Angled		S: Punctate
7 – Base Only	GCR				Round	

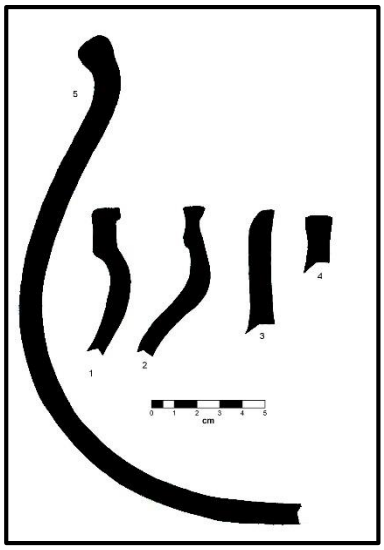


Figure 7: Profiles from the Blakiston site.

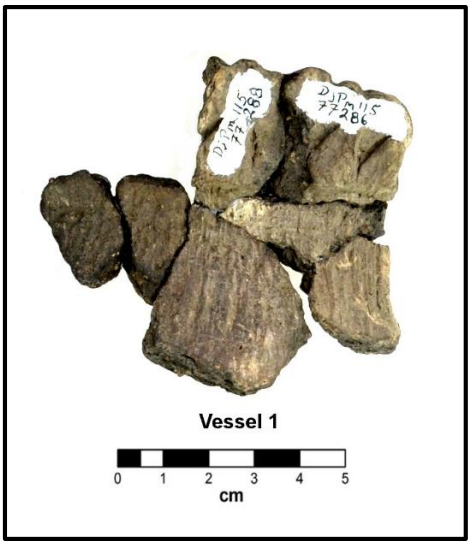


Figure 8: Photo of Vessel 1 from the Blakiston site.

At least three distinct styles were noted in the assemblage. Vessels 1 and 2 display unique qualities, such as fingernail pinches on the bottom of the collared rim and CWT impressions on the lip surface (Figure 8). This style is similar to the Lord Vessel that was found near Medicine Hat, AB (Walde and Meyer 2003) but has yet to be associated with any specific archaeological cultural group. Additional sherds were recorded but could not be confidently assigned to a vessel. Notable sherds include an angled shoulder with a vertical cord-roughened surface and a sharply angled neck sherd with a smooth surface. Vessel 3 has a tall, straight rim with dentates on the lip surface. Although the neck is just starting to curve, the straightness of the rim might be indicative of a sharp neck angle. Vessel 5 has a round shoulder with a dimpled surface, likely representing netted fabric impressions. The rim and neck on the vessel are short with a curved flare.

None of the vessels are directly associated with a radiocarbon date; however, based on the stratigraphy, Vessels 1, 2, and 5 were considered part of the Protohistoric component and Vessel 3 part of the Late Prehistoric component (Dau 1997:200-207). Although these particular vessels were assigned to components, sherds from all vessels

were recovered from both time periods. For the purpose of the current study, they were considered to postdate 730 BP and included in the Middle Time Period.

Bodo Archaeological Localities

The Bodo Archaeological Localities, including FaOm-1 (Bodo Bison Skulls), FaOm-22 (Bison Overlook), and various other sites in the vicinity, cover a huge area in the Sounding Basin, south of Eyehill Creek and west of Sounding Lake. These localities have been the subject of various studies and reports relating to oil and gas development, academic field schools, graduate research, and public archaeology programs starting in 1995 (Grekul 2012).

Generally, these archaeological projects have yielded artifacts associated with Oxbow and Pelican Lake components that date before 2200 years ago. Following a long period of environmental instability, soil development with associated cultural occupations returned approximately 1000 years ago. This later period of occupation has been linked to various archaeological entities including the Old Women's Phase, Mortlach, and Selkirk. Mann (2007, 2009) suggested that the area was a common space used by these prehistoric groups for hunting, butchering, processing, and camping (in Peck 2011:396-397). The rolling hills of the stabilized sand dunes and the tree patches on the edge of the parklands would have provided hunting blinds and resources for shelter, food, and fuel.

Substantial amounts of pottery have been recovered from the Bodo localities. Pottery descriptions from FaOm-1 were included in reports by Gibson and Grekul (2010) and Blaikie (2005). Other ceramic artifacts have been recovered from University of Alberta field schools, particularly from FaOm-22, but no reports are available from these seasons. Generally, the occupation levels tend to have highly variable pottery styles that

can be attributed to both Mortlach and Old Women's Phase types suggesting group interaction. These collections are used with caution since mixing of the two styles was possible.

Gibson and Grekul (2010) originally coded the vessels from Bodo Bison Skulls using letters that were assigned an equivalent number for the current study. A total of 14 vessels were examined at the Royal Alberta Museum, the Bodo Archaeological Centre, and the Provost and District Museum (Table 9, Figure 9).

Table 9: Vessel data from the Bodo Bison Skulls site.

Original Vessel Letter	Vessel	Surface Finish	Lip	Rim	Shoulder	Base	Decorative Elements by Portion
A	1	VCR	Expanding (both)	Vertical			R: Fingernail Impr.
B	2	VCR	Int. expanding	Vertical	Angled		R: Pinch; S: Fingernail Impr.
C	3	Roughened	Tapered	Vertical			
E	5	Roughened	Squared	Vertical	N/A		N: Incised Line
F	6	VCR	Ext. expanding	Vertical	None	Round	L: CWT
H	8	Roughened	Ext. expanding	Vertical			
I	9	VCR	Ext. expanding	N/A			R: Angular Impr.
J	10	VCR	Expanding (both), Ext. beveled	N/A			R: Angular Impr.
K	11	GCR	Expanding (both)	N/A			
L	12	N/A	Expanding (both)	N/A			
M	13	VCR	Ext. beveled	N/A			
L	14	N/A					N: CWT and Hollow Impr.
	15	VCR	Expanding (both), Ext. beveled	Flaring	Angled	Flat	L: Incised Line; S: Pinch
	17	Dimpled	Ext. expanding	Vertical			N: Punctate

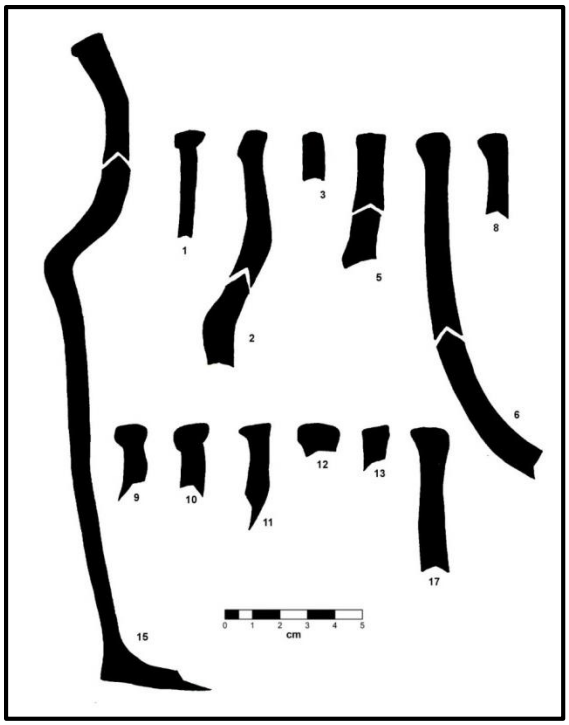


Figure 9: Vessel profiles from the Bodo Bison Skulls site.

The only temporal data available are for Vessel 15, which has a series of associated radiocarbon dates averaging approximately 150 BP (Blaikie 2005:96-98). This vessel was found associated with Late Prehistpric Period Side-notched projectile points, a pit and two hearth features, butchered faunal remains, and a variety of other lithic artifacts (Blaikie 2005:42, 66).

Several angled shoulder sherds with finger pinches or nail marks were also found in the collections that could not be confidently assigned to a vessel. The frequency of the tall rims and necks with finger marked angled shoulders is noteworthy and is discussed in detail in Chapter 5. Vessel 6 is unique because its shape represents a small bowl form. The neck decorations on Vessels 5, 14, and 17 are rare compared to other site assemblages.

Collections from FaOm-22 were assessed at the Royal Alberta Museum and the Bodo Archaeological Centre. These vessels were recovered during the U of A field

schools but no previous analysis has been completed. A sample of rim portions were selected for the current study (Table 10, Figure 10). Attempts were made to exclude Mortlach and Selkirk styles, but mixing is possible.

Table 10: Vessel data from the Bodo Overlook site.

Vessel	Surface Finish	Lip	Rim	Decorative
1	N/A	Expanding (both)	N/A	L: Dentate; R: Pinch and Dentate
2	N/A	Squared	N/A	L: Dentate
3	Smooth	Expanding (both), Ext. beveled	N/A	
4	VCR	Int. expanding	N/A	L: CWT; R: Pinch
5	Smooth	Ext. beveled	N/A	

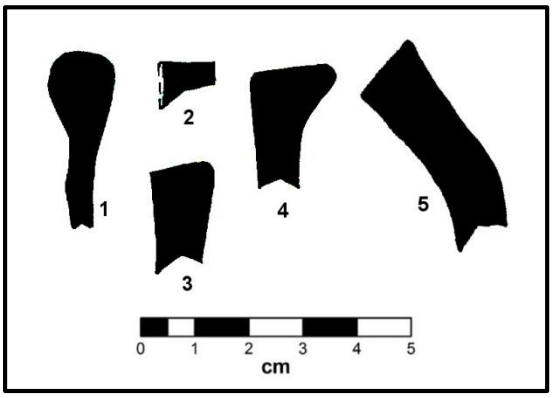


Figure 10: Rim profiles from the Bodo Overlook site.

The rim orientation could not be determined for any of the FaOm-22 vessels due to the small portions present. The diameter of Vessel 5 indicates a flaring form, but the angle could not be ascertained. Vessel 1 displays finger pinches above at least two rows of horizontal dentates. Shoulder forms were also recorded but were not be assigned to a particular rim; one of which has fingernail impressions. Two small neck sherds also have punctates with cord-roughened surfaces.

Bridgewater - EfPl-34

The Bridgewater site is a buried campsite situated on a terrace feature, approximately 400 m south of the Bow River and just upstream from the FM Ranch Campsite. The only research conducted at the site was an excavation by the University of Calgary in 1971 and only two paragraphs about the site are published (Byrne 1973:107, 304). The excavation units were dug in natural and arbitrary levels. Level 1 was disturbed by the plow zone, Level 2 included everything above 10 cm, and Level 3 was 10-25 cm below surface. Byrne (1973) noted that the excavation did continue deeper but he did not report details since the pottery was only recovered from these upper three levels. At least four components are noted on the site from as well as an Avonlea point, pottery, lithic debitage, FBR, and faunal remains. Peck (2011:379) also recorded that an ammonite fossil was identified in the collection curated at the Royal Alberta Museum. Byrne (1973:304) assigned all of the pottery from the site into his Saskatchewan Basin Complex: Late Variant from Period II (800 to 250 BP) based on the associated side-notched projectile points and the lack of historic items.

Two distinct vessels were identified in the collections held at the University of Calgary (Table 11, Figure 11). Additional sherds include a neck and neck/shoulder sherd fragment that could not be assigned to a vessel.

Table 11: Vessel data from the Bridgewater site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	VCR	Ext. expanding	Vertical	Angled	
2	VCR	Expanding (both), Ext. beveled	Vertical	Angled	S: Punctate

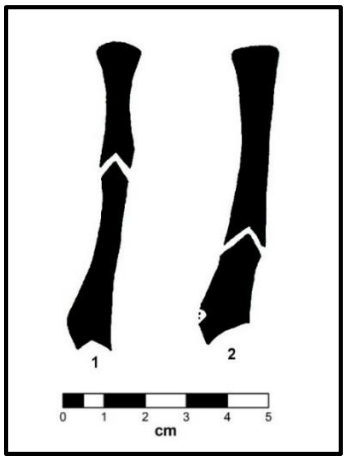


Figure 11: Profiles from the Bridgewater site.

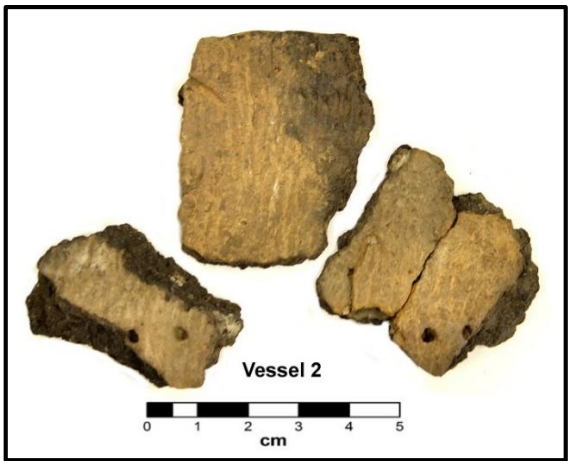


Figure 12: Photo of Vessel 2 from the Bridgewater site.

The two vessels from the Bridgewater collections have long necks, vertical rims, and angled shoulders. The shoulder punctates on Vessel 2 were one of the only distinguishing elements between the two vessels (Figure 12). The punctates are relatively small compared to other punctates in this study, measuring only 2.5 mm in diameter and spaced less than a centimeter apart.

British Block Medicine Wheel - EdOp-1

The British Block Medicine Wheel and Effigy is situated on a high hill, overlooking the South Saskatchewan River Valley to the south and east. The Cypress Hills can be seen to the southeast. The site is located within the Canadian Forces Base Suffield near Medicine Hat making access very restricted. Most of what is known about the site comes from the 1961 and 1962 excavations of the central cairn led by Forbis (Wormington and Forbis 1965:122-125). No additional excavations have been conducted.

The site consists of a central cairn surrounded by a large stone ring 24 m in diameter. An effigy (Napi) figure is outside the ring. Numerous tipi rings are in the

immediate vicinity (Wormington and Forbis 1965:124; Peck 2011:185). Artifacts recovered from the excavations include pottery fragments and a continuous sequence of projectile points from McKean to Plains Side-notched. No stratigraphic context is available for the any of the artifacts.

Byrne (1973) included the ceramic material in his study. He identified several sherds with check-stamped, vertical cord-roughened, and smooth surface finishes. Byrne (1973:128) also noted a flat base sherd with truncated cord impressions; however, based on personal observation, this sherd appears be to a broken rim fragment. Due to the questionable nature of this sherd, it was removed from the current analysis.

Two vessels from this site were examined at the University of Calgary (

Table 12, Figure 13). They were included because of their thickness and coarse paste characteristics. Vessel 2 has a very straight and flaring rim with a sharp neck angle.

Table 12: Vessel data from the British Block Medicine Wheel site.

Vessel	Surface Finish	Lip	Rim
1	VCR	Ext. beveled	N/A
2	Smooth	Squared	Flaring

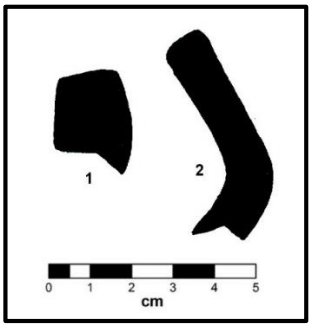


Figure 13: Rim profiles from the British Block Medicine Wheel site.

Cache - 24HL49

Several archaeological sites have been identified near the Fresno Reservoir, a flood controlled impoundment of the Milk River in Montana. Keyser (1979, 1980) first reported on the sites in 1979 and later presented the data again in 1980. Keyser and Byrne

(1980) engaged in a debate over the pottery recovered from five of these sites, including Fresno (24HL103), Kremlin (24HL401), Cache (24HL49), Milk River (24HL52), and Stallcop (24HL102). A vessel from the Stallcop site is highly decorated and has a collared rim that likely represents a pottery type from the Middle Missouri area. Keyser referred to the pottery from the remaining four sites as *Fresno Area Utility Ware* and suggested a connection with the Saskatchewan Basin Complex: Late Variant (Keyser and Byrne 1980:17). Byrne disagreed with Keyser (Keyser and Byrne 1980:24), suggesting the pottery from this area more closely resembles Cluny Complex material or otherwise lacks diagnostic features to permit any typological classification other than a general Plains Woodland Tradition. The Cache and Fresno sites have large enough collections to explore this debate. The Kremlin and Milk River sites have minimal material and will not be discussed further.

Artifacts from the Cache site consist of two vessels found one inside the other on a clay pedestal, under a sandstone overhang (Keyser and Byrne 1980:11). No other artifacts were found at the site. Keyser (Keyser and Byrne 1980:13) suggested that these vessels were cached by people who were using the Fresno and Milk River sites, located less than 2 km to the west. Due to the lack of associated artifacts, it is difficult to treat these vessels as anything other than surface finds. However, their deliberate placement provides a rare opportunity to include well-preserved pieces that correspond with the Ethridge ware, Saskatchewan Basin Complex: Late Variant, and Old Women's Phase pottery descriptions.

Ceramic descriptions have been taken from Keyser and Byrne (1980:12-13). Vessel 1 is very well-preserved. It has a globular shape, constricted neck, flaring rim, and

distinct shoulder. The surface finish is smooth with no decorative elements. Vessel 2, found inside Vessel 1, is not as well preserved and has a vertical cord-roughened surface and a rounder neck and shoulder, but otherwise is similar to Vessel 1 (Table 13, Figure 14). Vessel 1 has a straight and flaring rim with a sharp neck angle. Vessel 2 is rounder in form and has a short and curved rim and neck.

Table 13: Vessel data from the Cache site.

Vessel	Surface Finish	Rim	Shoulder	Base
1	Smooth	Flaring	Angled	Round
2	VCR	Flaring	Round	

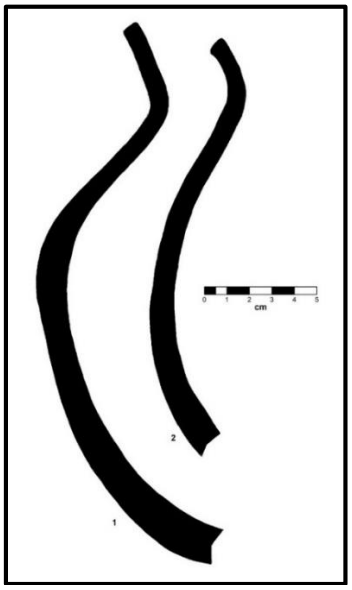


Figure 14: Vessel profiles from the Cache site, adapted from Keyser (1980: 12-13, Figures 6 and 7).

Castle Forks Buffalo Jump - DjPm-126

The Castle Forks Buffalo Jump is an Old Women's Phase camp and kill site located on a terrace feature on the south side of the Oldman River, upstream from the confluence with the Castle River (Landals 1990; Peck 2011:319). Reeves (1987) first recorded the site in 1985 during an assessment of the drive lanes on the prairie surface

(DjPm-19), but no subsurface tests were conducted. Testing and subsequent excavations of the lower deposits took place in 1988 and 1989 to mitigate the kill sites that would be affected by the Oldman River Dam (Landals 1990).

There were four stratified cultural levels identified at the site, each separated by rapid alluvial and colluvial deposition. The cultural levels are associated with periods of stability marked by paleosoils (Landals 1990:245). The earliest level (Cultural Unit 4) was scarce in materials, consisting of faunal remains from a single bison radiocarbon dated to 960±80 BP and several large sandstone slabs. Artifacts associated with Cultural Unit (CU) 3 were found directly above a poorly developed paleosoil. This CU is classified as a campsite consisting of at least one tipi ring, two hearth features, 181 ceramic sherds, 10 Late Plains Side-notched projectile points, lithic debitage, and red ochre fragments. The majority of sherds were recovered from within 2 m of a hearth feature (Landals 1990:278-288). Heavily butchered faunal material was radiocarbon dated to 460±80 BP. Landals (1990:288) suggested that this occupation event was a late winter or early spring campsite due to the presence of some foetal bone and heavily butchered bone to extract more resources during times when food was less abundant. CU 2 contained mostly bison bone associated with the cliff jump site, but was said to be mixed with the remains from CU 3 based on the presence of two pots sherds which are thought to be part of a vessel from the earlier occupation (Landals 1990:288). The faunal material recovered from CU 2 has a radiocarbon date of 520±90 BP, which is slightly older than the lower level though the standard deviation of the dates overlap. These occupations were likely relatively close in time. The uppermost layer (CU 1) was a bison bone bed associated with the jump site. The erroneous radiocarbon date of 670±100 BP

has been deemed unreliable due to the presence of a metal point. Landals (1990:274) suggested that the DjPm-115 (Blakiston) site is the campsite associated with the kill sites of CU 1 and 2.

The ceramic material recovered from CU 3 was originally assessed by Steinhauser (1990) who used Byrne's (1973) classification system. Based on the radiocarbon dates and finger pinches on the shoulders, the ceramics from the Castle Forks Buffalo Jump were assigned to the Saskatchewan Basin Complex: Late Variant. The ceramic material was grouped into five vessels lots which were examined at the Royal Alberta Museum (Table 14, Figure 15).

Table 14: Vessel data from the Castle Forks Buffalo Jump site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	Smooth	Squared	Vertical	Angled	S: Finger Impr.
2	VCR	Expanding (both)	Flaring		
3	VCR	Expanding (both)	N/A		
4	GCR	Ext. expanding	Vertical		L: CWT
5	VCR	Expanding (both)	Vertical	Angled	R: Pinch; S: Fingernail Impr.

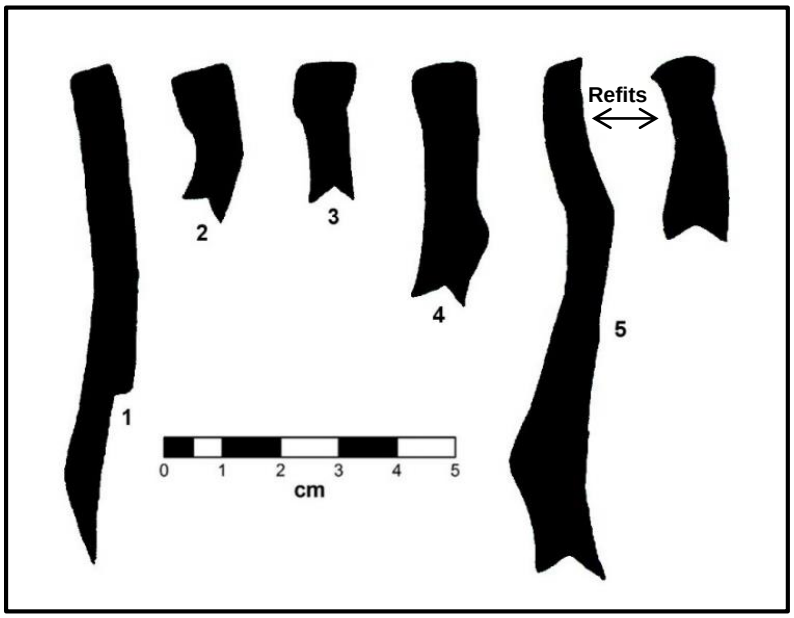


Figure 15: Profiles from the Castle Forks Buffalo Jump.

Surface finishes include either a smooth finish or thin vertical cord impressions less than 2 mm thick. Vessels 1 and 5 have long rims with a mildly constricted neck, while Vessel 2 has a shorter, more flaring rim. All of these vessels have high variability within the same portion on the same vessel. Vessel 5 in particular has considerable variation in lip and rim forms, suggesting that the potter was not concerned about rim profile and thickness consistency.

Corey Ranch - 24TT83

The Corey Ranch site is a very large multi-component campsite located on the north bank of the Teton River in Montana. The site was excavated in 1985 and stretches across a river terrace for almost 20 000 m^2 (Quigg 1988:145). A total of 20 partial to complete stone circles were identified, 13 of which were excavated. Stone Circle 15 contained associated cultural material 13-22 cm below surface, including an Avonlea style projectile point, lithic debitage, FBR, faunal remains, 269 ceramic sherds, and a rock lined boiling pit feature (Quigg 1988:145). The pit had smashed animal bones radiocarbon dated to 1080±80 BP. A potsherd was dated using thermoluminesense to 970±80 BP.

Quigg (1988:146) described the single vessel as globular in form, with a vertical to slightly flaring rim, constricted neck, rounded shoulder, smooth surface, and a thickened lip. There are oblique cord-wrapped tool impressions on the upper rim. Quigg (1988) interpreted this vessel to be new type of Avonlea pottery based on the associated Avonlea projectile points and the average date of 1025 BP. He compared the vessel to the complex profiles found at the Upper Kill site which Forbis (1960) described and the Garratt site documented by Kehoe (1973). Walde et al. (1995:22) suggested that this

vessel actually represents Ethridge ware and that the Corey Ranch site is better described as a transitional Avonlea - Old Women's Phase site.

Although this collection is currently difficult to access, Quigg (1988) provided clear photos and sketches of the vessel as well as detailed descriptions and measurements. Data used in this study came directly from this publication (Table 15, Figure 16). The CWT impressions on this vessel are on the upper rim edge. The cord wrapped around the tool was very thin, only 1-1.5 mm thick (Quigg 1988:146). The shoulder is not very distinct and the neck is only mildly constricted.

Table 15: Vessel data from the Corey Ranch site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Element by Portion
1	Smooth	Squared	Flaring	Round	R: CWT

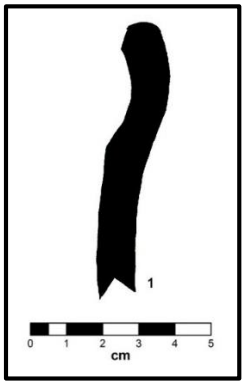


Figure 16: Profile drawing from the Corey Ranch site, adapted from Quigg (1988:147, Figure 4).

DgPa-3 and DgPa-4

DgPa-3 and DgPa-4 are archaeological campsites located on a series of terraces on the southwest bank of the Milk River, approximately 1.5 km south of the Town of Milk River. DgPa-3 is on a terrace 2 m higher than DgPa-4. It is uncertain when these sites were first recorded. Byrne (1973) used one miscellaneous sherd from DgPa-3 in his study.

In 1984, an Old Women's Phase occupation level was identified at DgPa-3 based on the presence of side-notched projectile points and 5 pottery sherds (Saylor 1985). Additional excavations took place in 2003 by Stantec, but this analysis is still in progress and the report is not currently available. An interim draft report, written by Chuck and Allyson Ramsay, of the ceramic analysis conducted by Kent Fowler was provided by Alison Landals of Stantec (unpublished report).

A total of 1077 sherds were recovered from the 2003 season and were separated into at least four vessels. Her report provided photos and written descriptions of the vessels, but there is currently no contextual information available. Vessel descriptions from this report were used for the current study (Table 16).

Table 16: Vessel data from the DgPa-3 site.

Vessel	Portions Present	Surface Finish	Lip	Rim	Decorative Elements by Portion
1	R, N, S	VCR	Expanding (both), Ext. beveled	Vertical	R: Finger Impr.
2	R	Smooth	Squared	Vertical	L: Tiny Punctates
3	R	N/A	Expanding (both), Ext. beveled	N/A	R: Finger Impr.
4	R	N/A	Expanding (both)	N/A	

The report photos show Vessel 1 having a tall rim and neck. The finger impressions located along the upper rim edge appear to be similar to the vessels from Antelope Creek and the Saamis sites.

DgPa-4 was also excavated in 1984 (Saylor 1985) and by Stantec in 2003. Three distinct occupation levels were identified, starting with Pelican Lake, followed by an Avonlea level (based on a triangular point and 13 non-diagnostic ceramic sherds), and an Old Women's Phase level. Remains from this Old Women's Phase occupation indicated a stone circle, a single projectile point, faunal remains, lithic debitage, and a single

ceramic sherd (Saylor 1985:39-75). Although no report is currently available from the 2003 season, large portions of two ceramic vessels were accessible at the Royal Alberta Museum (Table 17, Figure 17). These vessels fit within the Old Women's Phase pottery descriptions; however, as with DgPa-3, their associated context is currently unavailable.

Table 17: Vessel data from the DgPa-4 site.

Vessel	Surface Finish	Lip	Rim	Shoulder
1	VCR	Expanding (both)	Flaring	Round
2	VCR	Int. expanding	Vertical	Angled

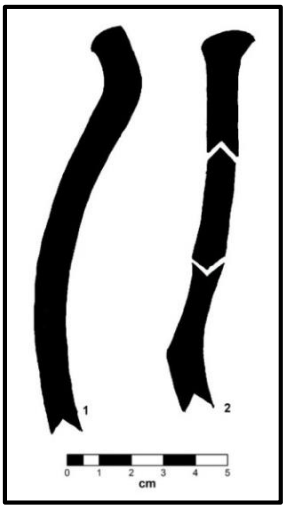


Figure 17: Vessel Profile drawings from the DgPa-4 site.

Vessel 1 has a short, flaring neck and rim profile with a round, globular body, while Vessel 2 has a tall rim and neck with an angled shoulder. Both vessels have vertically cord-roughened surfaces and neither has any evidence of decoration.

Dundurn Vessels

Two vessels from the University of Saskatchewan collections are referenced as the *Dundurn Vessels* (David Meyer 2013, personal communication). Their original provenience is unknown, but Wettlaufer (1951:35) provided a caption for some hand drawn images by Dorothy Wettlaufer that states:

> One and a half miles southwest of Dundurn. "big Pot Site" of Dr. Vigfusson. He restored one complete pot and large portions of 4 or 5 more. Most of the pottery is in the Saskatoon museum and Mr. Cronk has several pieces. Site not located yet.

The Town of Dundurn, Saskatchewan is northeast of Brightwater Lake, south of Saskatoon. Several archaeological sites in this area have been named after the Dundurn locality. These vessels have not been documented since Wettlaufer's (1951:35) report. They were made available at the University of Saskatchewan (Table 18, Figures 18-23). The thick complex profiles with coarse temper fits within the Old Women's Phase pottery characteristics. The relatively complete profiles of these vessels provide a rare opportunity to observe the overall form.

Table 18: Data from the Dundurn Vessels.

Vessel	Surface Finish	Lip	Rim	Shoulder	Base	Decorative Elements by Portion
1	VCR	Expanding (both), Ext. beveled	Flaring	Round	Flat	L: CWT
2	VCR	Ext. beveled	Flaring	Angled	Flat	L: CWT

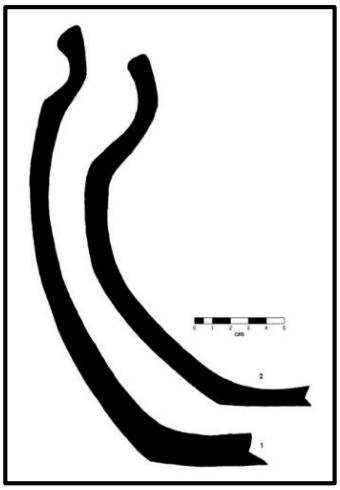


Figure 18: Profile drawing of the Dundurn Vessels.

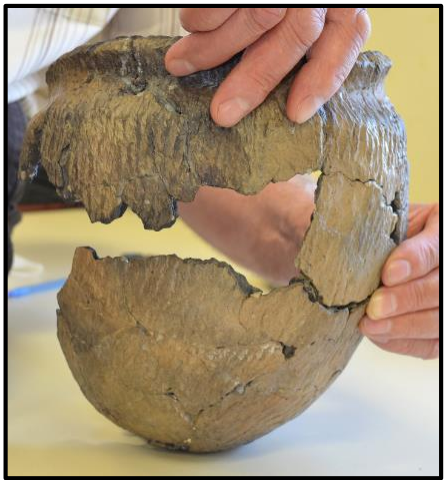


Figure 19: Photo of Dundurn Vessel 1.

Figure 20: Photo showing the lip decoration on Dundurn Vessel 1.

Figure 21: Photo of Dundurn Vessel 2.

Figure 22: Photo of the base cross section of Dundurn Vessel 2.

Figure 23: Photo showing the lip decoration of Dundurn Vessel 2.

The two Dundurn vessels are very similar. They both have partially smoothed cord-roughened surfaces, flared rims, and flat bases. They also both have wide CWT impressions on the lip surface. Vessel 1 is significantly taller and has a less pronounced shoulder than Vessel 2, which has a wider, globular body.

EbPi-51, EbPi-52, EbPi-57, EbPi-63, EbPi-67, and EbPi-73

A series of archaeological sites were identified near the Little Bow Reservoir in 2000, 2001, and 2002 by FMA Heritage Resources Consultant Inc. The report for these sites is still in progress. Dr. Dale Walde from the University of Calgary completed the ceramics analysis for these sites and provided his unpublished manuscript (Walde 2006a). He analyzed 6137 shreds and grouped them into 38 vessels lots. Out of these vessel lots, 21 were assigned to the Old Women's Phase, four to the One Gun Phase, and three to Mortlach. Vessels that were assigned to the Old Women's Phase were included in this study (Table 19, Figures 24 and 25). Although Walde (2006a:70) was not comfortable assigning Vessel 2 from EbPi-73 to the Old Women's Phase, it was added to the database for comparative purposes. Data used came directly from Walde's (2006a) report.

Table 19: Vessel data from the EbPi-51, EbPi-52, EbPi-57, EbPi-63, EbPi-67, and EbPi-73 sites.

Site	Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
EbPi-51	2	Roughened	Round	N/A		R: Punctate
EbPi-51	3	Roughened	Subround	N/A		R: Punctate
EbPi-52	2	VCR	Expanding (both), Ext. beveled	N/A		R: Pinch
EbPi-57	1	VCR	Expanding (both)	N/A		L: CWT ; R: Incised Line
EbPi-57	2	VCR	Squared	N/A		
EbPi-57	3	VCR	Expanding (both)	N/A		
EbPi-63	1	Smooth	Ext. expanding	Vertical		
EbPi-63	2	VCR	Ext. expanding, Int. beveled	N/A		R: Finger Impr.
EbPi-67	1	N/A	Ext. beveled	Vertical		R: CWT
EbPi-67	2	Roughened	Expanding (both)	N/A		
EbPi-67	4	Smooth	Tapered	N/A		
EbPi-73	1	Smooth	Expanding (both)	N/A		
EbPi-73	2	Roughened	Tapered	N/A		
EbPi-73	4	GCR	Int. beveled	Vertical		
EbPi-73	**5**	Roughened	Squared	Vertical		R: Finger Impr.
EbPi-73	6	Roughened	Ext. beveled	N/A		
EbPi-73	7	Smooth	Expanding (both), Ext. beveled	Vertical		
EbPi-73	8	Roughened	Expanding (both)	Vertical		
EbPi-73	13	GCR	Expanding (both)	Vertical		L: Incised Line
EbPi-73	15	VCR	Ext. beveled	N/A		
EbPi-73	16	Smooth	Tapered	N/A		
EbPi-73	17	VCR	Expanding (both)	Vertical	Round	

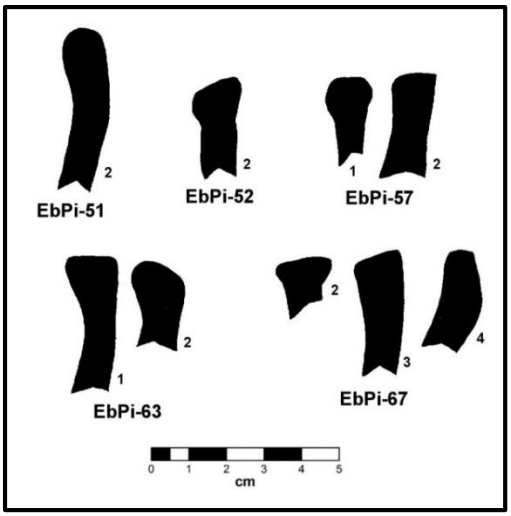


Figure 24: Rim prorile drawings from EbPi-51, EbPi-52, EbPi-57, EbPi-63, and EbPi-67, adapted from Walde (2006a).

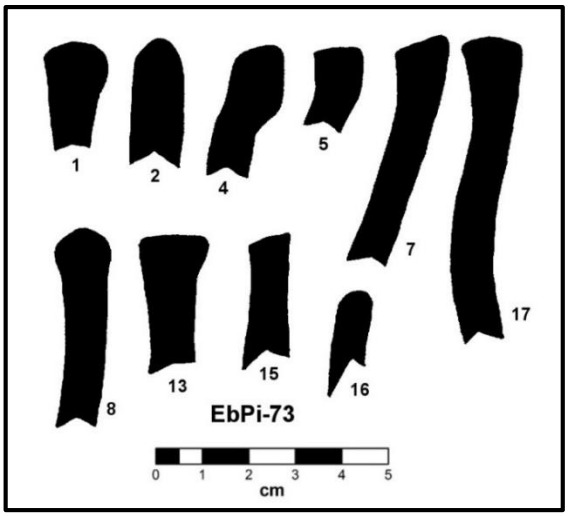


Figure 25: Profile drawings from EbPi-57, adapted from Walde (2006a).

Walde (2006a) compared the assemblages from around the Little Bow Reservoir with the Junction site ceramics and interpreted them as a distinct ceramic type with short rim heights and thick lips. *The Little Bow Short Rim* type has rim heights ranging from 17-34 mm and lip thicknesses from 6.5-10.5 mm, which tend to occur within the last 300 years BP (Walde 2006a:100). These characteristics differ from the *Junction Narrow Lip* type, which has dates that are slightly older. This type will be discussed in more detail under the Junction site ceramic descriptions section.

After comparing the descriptions of the Little Bow Short Rim type with other Old Women's Phase ceramic assemblages, there appears to be a number of common attributes. The finger impressed rim edge is a re-occurring trend, along with the expanding lip form. It is difficult to determine the full length of the rim and neck since the shoulder portions were not described. The gradual curve of the neck from the rim, suggests that the neck might have only been slightly constricted in relation to the

shoulder. Vessel 17 has the most complete form and displays a shorter rim and round shoulder.

EfOw-26

This multi-component campsite is located on a coulee-bottom terrace at the eastern point of the Deadfish Dam, north and east of a meandering channel of Deadfish Creek. Goldsmith (2003:24-29) first identified the site in 2002 during a development project survey. Surface finds and backhoe tests resulted in a mitigative excavation (Goldsmith et al. 2005). This excavation identified five buried cultural components and 16 features.

The earliest two components are considered Besant occupations based on projectile points and a series of radiocarbon dates of approximately 1800 BP. Component 3 contained the highest concentration of ceramic material and has a date of 260±60 BP. Although this component is considered undisturbed, ceramic material contemporary with these levels also came from Components 2 and 4. Component 3 contained three hearth features and two micro-debitage concentrations, along with shell beads and other shell fragments (Goldsmith et al. 2005:194). Components 1 and 2 are considered mixed due to an unreliable radiocarbon date of 2240±60 BP and soil patterns suggesting a series of alluvial events. Both of these components yielded Late Side-notched projectile points.

A total of 323 ceramic sherds were found associated with Component 3. Dr. Dale Walde confirmed that most of the ceramic material resembles Ethridge ware, with the exception of one sherd with CWT impressions in a chevron design (Goldsmith et al. 2005:155). This motif is typical of Mortlach and Cluny pottery.

The assessment of the collections housed at the Royal Alberta Museum resulted in the identification of two vessels based on different lip forms (Table 20, Figure 26).

Table 20: Vessel data from the EfOw-26 site.

Vessel	Surface Finish	Lip	Rim	Shoulder
1	VCR	Expanding (both)	N/A	Angled
2	N/A	Int. Expanding, Ext beveled	N/A	

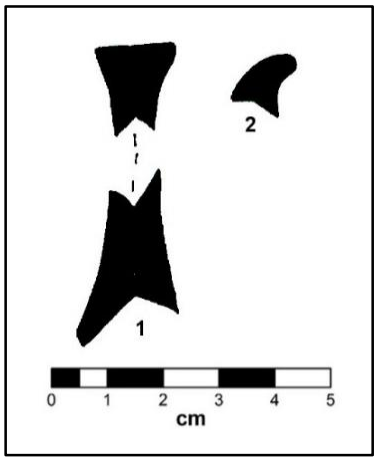


Figure 26: Profile drawings from the EfOw-26 site.

This is a very small collection. Additional neck and body sherds were also present but not assignable to a vessel. Vessel 1 was identified based on similar paste and thickness. Although the rim and neck are likely tall, the lack of refitted sherds prevents more detailed measurements.

EgPm-82

EgPm-82 is a secondary processing and campsite currently located under the Beddington Trail overpass of Stoney Trail in north-west Calgary. The site was originally recorded as a surface campsite by a team from the University of Calgary. It was revisited several times for CRM projects in 1997 and 1998 which resulted in the recovery of a small amount of cultural material including FBR, lithics, butchered bone, a broken biface,

and a retouched flake (de Mill 1997; Head 1997, 1998). In 2003-2004, the site was revisited by Peach et al. (2006) for a CRM project that led to mitigative excavations.

The site is considered a single mixed Old Women's Phase component (Peach et al. 2006). Extensive plow disturbance was recorded from 10-25 cm below the surface and has mixed any evidence of stratigraphic separation. Cultural material recovered from the 2003 and 2004 excavations include butchered bison bone, FBR, ceramics, many lithic scrapers, and projectile points ranging from late Avonlea to Prairie and Plains Side-notched. One probable hearth feature was also identified (Peach et al. 2006:117). Two samples were taken from 30 cm below surface which yielded radiocarbon dates of 890±40 BP from bone and 970±40 BP from charcoal in the hearth (Peach et al. 2006:44-122). An approximate date of 930 BP was used in this study.

A total of 66 ceramic sherds were recovered from the site and have been described as Old Women's Phase ceramics (Peach et al. 2006:92-95, 122). Most of the sherds were recovered below the plow zone, approximately 1-2 m away from the suspected hearth feature. The preservation of the sherds is quite poor and many of their exteriors have deteriorated. Although exact cultural context could not be confirmed, it is likely that the ceramics are associated with the charcoal, ash, and FBR concentration date to approximately 930 BP.

Peach et al. (2006:93) reported that decorative elements include CWT impressions on the lip, dentates on the lip/neck, and possible punctates. Surfaces finishes that could be identified included textile impressed. Only a small sample if these ceramics at the Royal Alberta Museum was examined as part of this study, which included one rim

portion. Only the top of the lip was present and displayed CWT impressions on its surface. No profiles are available for this vessel.

EkPf-38

EkPf-38 is an isolated surface find, consisting of half of a complete ceramic vessel. The vessel was found by the Allen family in 2001. It came from the east side of the Red Deer River near the Morrin Bridge and Castle Butte, north of Drumheller. It was later brought to the Royal Alberta Museum in 2006 (Giering, unpublished site form on file). The interior of the vessel had a thick carbonized residue and portions of it had been removed for analysis. The residue resulted in a radiocarbon date of 830±40 BP.

This vessel was made available in 2013 for the current study (Figure 27). It has a complex profile with a very rounded, globular shoulder and body, a straight, flared rim, and an abrupt neck angle. The surface finish has a dimpled texture suggesting it was net-impressed.

Figure 27: Vessel from the EkPf-38 site: Profile drawing (left), photo of front view (center), and photo of side view (right).

Ethridge Site

The Ethridge site is a campsite associated with a bison jump kill site in the Marias River Drainage, located approximately 13 km northwest of the Town of Ethridge, Montana. The site has not been systematically tested. Wedel (1951) provided the only direct description of the artifacts that have been collected. He referenced a letter from Giles Ortscheid who originally collected the artifacts stating that the cultural material was "found at the lower end of a deep cleft in an east-facing escarpment some 200 feet high" (Wedel 1951:131). Artifacts include 100 pottery sherds, projectile points, scrapers, debitage, shell fragments, and three brass fragments. The pottery came from the surface and approximately 13 cm below.

Wedel (1951:131) described the pottery as having fabric-impressed, cord-impressed, and plain surface finishes. Two or three sherds had fluted (simple stamped) surface finishes. Approximately 12 shoulder sherds were identified, some with vertical or diagonal notches on the shoulder, some of which are impressed with a cord-wrapped object. These impressions are also found on some of the rim sherds. One rim sherd displays CWT impressions on the lip surface.

Kehoe (1959:238) used this site as the type site assemblage to define Ethridge ware. Although the pottery from the Ethridge site is unavailable at this time, the general attributes described by Wedel (1951) were used in the current typological analysis.

FM Ranch Campsite - EfPk-1

The FM Ranch Campsite is located on a low terrace on the southwest bank of the Bow River, approximately 19 km southeast of Calgary. The site is believed to be the campsite for the FM Ranch Buffalo Jump located less than 1 km to the south. Forbis first

tested the site in 1959, but no report was submitted (Vickers 1982:2). Byrne (1973:106-107) noted the excavations and stated that the pottery came from the third layer below the surface. Excavations in 1974 were conducted by Rogers and Fromhold (1975) and auger tests were dug in 1980 to determine the site boundaries (Vickers 1982).

At least seven cultural components have been identified. The earliest component is thought to be Avonlea, but there are no diagnostic artifacts to confirm this (Rogers and Fromhold 1975:13). Components 2-6 have been classified as part of the Old Women's Phase. Artifacts from these components consist of a significant amount of FBR, butchered bison bone, some bird and dog bones, ceramics, and stone tools, including Nanton, Pekisko, and Washita (Plains Side-notched) projectile points (Rogers and Fromhold 1975:9-13). The uppermost component contains Protohistoric and Historic artifacts mixed with material from the lower levels. The dates of Components 2-6 were estimated to fall between A.D. 1000 and 1650.

Rogers and Fromhold (1975:21-25) described six vessels that were recovered through the excavation; however, only Vessel 1 from that study could be identified. Two other vessels were examined but could not be associated with previous vessel numbers. Vessels 7 and 8 were assigned new numbers to prevent overlap with the previously assigned vessel numbers, though Byrne (1973) included Vessel 8 in his analysis. Vessels 1 and 8 were examined at the University of Calgary and Vessel 7 at the Royal Alberta Museum (Table 21, Figure 28).

Table 21: Vessel data from the FM Ranch Campsite.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	N/A	Expanding (both), Ext. beveled	Vertical	Round	L: Linear Impr.
7	Smooth	Ext. expanding	N/A		
8	GCR	Ext. beveled	Flaring	Angled	L: CWT; N/B: Paddle-edge

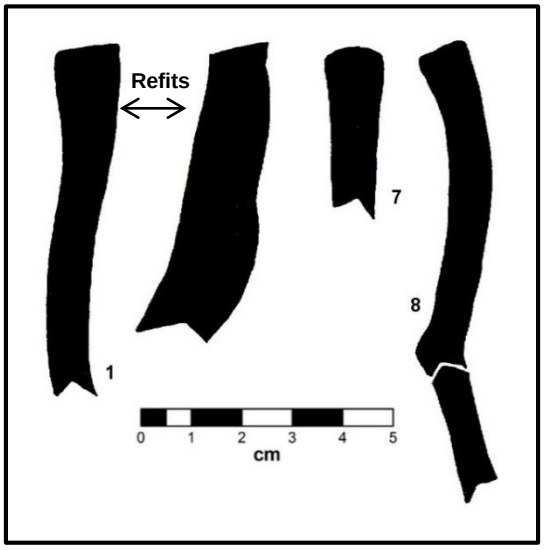


Figure 28: Profile drawings from the FM Ranch Campsite.

Byrne (1973:106, 192, 657) classified the pottery that was recovered in 1959 as Saskatchewan Basin Complex: Late Variant from Period II (800 to 250 BP) based on the presence of thick, smooth sherds and woven-fabric-impressed surface finishes. Vessel 8 was described as having single rows of tall, narrow punctates running immediately above and below the shoulder ridge (Byrne 1973:192, 719 Plate 17 f.). These same marks were also noted on the lip surface. Walde has re-examined this material and compared it to similar impressions on the sherds from other sites and suggested that this pattern might have been caused by impressing the side of a cord-wrapped paddle into the wet clay (Walde et al. 2010:157). He further emphasized the unique attributes of this pattern by suggesting that it should be defined as *Hunter Valley Edge-Paddled* type based on the site

from which it was first identified. This vessel has a long neck and rim, an angled shoulder, and CWT impressions on the lip surface. Vessel 1 has a relatively smooth surface but there is an underlying texture that could not be determined. Two linear impressions have been placed on the lip surface, but do not continue around the whole vessel. The form of Vessel 1 is difficult to define because it is so inconsistent; sherds that refit vary significantly (Figure 28:1).

Fresno - 24HL103

The Fresno site is one of the five sites identified near the Fresno Reservoir. It is described with the Cache site (Keyser and Byrne 1980). The Fresno site is a multi-component bison kill and campsite located on the south bank of the Fresno Reservoir. The lower occupation level is associated with Besant material dating to 1700±120 BP. The upper occupation level is associated with Old Women's Phase material, including approximately 2000 pottery sherds, triangular projectile points, bison bones, debitage, and ground stone tools. Postholes were found in both levels indicating the construction of a pound structure (Keyser 1979). Obsidian hydration dates indicate that the site was in use sometime between A.D. 1550 and AD 1700. A minimum of six vessels were identified.

Data from the Fresno site came directly from Keyser (1979) and Keyser and Byrne (1980), which included photos of Vessels 1-5 (Table 22, Figure 29).

Table 22: Vessel data from the Fresno site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Base	Decorative Elements by Portion
1	Smooth	Expanding (both)	Constricted	Round		
2	Stamped	Expanding (both)	Flaring	Round		
3	VCR	Expanding (both)	Constricted	None		L: Linear Impr.
4	GCR	Expanding (both)	Constricted	None	Round	L: CWT
5	N/A	Ext. beveled	N/A	Round		L: CWT; R: Hole
6	GCR	Expanding (both)	N/A			R: Boss

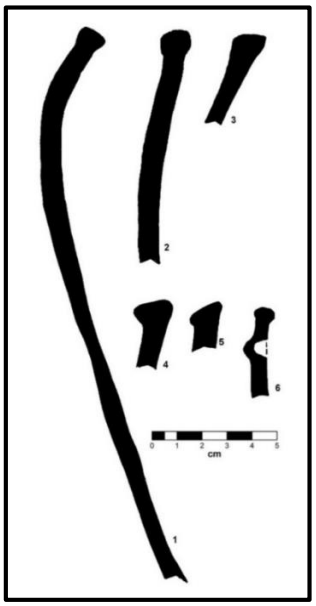


Figure 29: Profile drawings from the Fresno site, adapted from Keyser and Byrne (1980:13, Figure 7).

Many of the vessels have a constricted, in sloping rim. The most common decorative elements are oblique CWT impressions on the lip surface. Surface finishes include smooth, vertical cord-impressions, and check-stamps. No image of the Vessel 4 base was provided by Keyser (1979), but the descriptions indicate it was round. Byrne (Keyser and Byrne 1980:24) argued that these vessels more closely match the descriptions of Cluny ceramics based on the check-stamped surface finish of Vessel 2. The constricted rims and lack of complex profiles are also not common in other Old Women's Phase pottery assemblages. Vessel 6 has a punctate on the interior of the

vessel, producing a boss on the exterior rim surface. This element was rarely encountered in this study.

Garratt - EcNj-7

The Garratt site is a secondary processing and campsite on the floodplain of Moose Jaw Creek, currently situated in Kingsway Park in the City of Moose Jaw (Morgan 1979:74). The site was first reported to the Saskatchewan Museum of Natural History in 1966 by the landowner, Paul Garratt. Excavations took place in 1966 and 1968 by the SMNH and the cultural material was later assessed by Morgan (1979).

Three components were identified during excavations. The earliest is considered to be a Besant occupation based on the projectile points. The next component had Avonlea projectile points and a minimum of 10 ceramic vessels with simple profiles (lacking a distinct neck or shoulder), net-impressed surface finishes, and minimal decoration near the lip (Morgan 1979:362-365). The latest component was likely mixed in an upper plow zone, though Morgan (1979:88) noted that material found *in situ* from below this zone is nearly indistinguishable from the disturbed context. Material recovered from these levels include 19 Prairie Side-notched and two Plains Side-notched projectile points, hammerstones, choppers, bone tools, butchered faunal remains, metal artifacts, and ceramics.

At least 10 vessels were found in the uppermost component (Morgan 1978:294-317). The dominant surface finish is vertical cord-impressed, but fabric-impressed and plain surfaces are also present. At least three of the vessels have shoulders and a constricted neck. Decorative elements on the lip surface and corners include punctates, incised lines, cord-wrapped tool impressions, and a chevron pattern impressed on one of

the rims. Morgan (1979:201) noted that pottery from these levels may represent a "hybridization of eastern and western traits" representing the Saskatchewan Basin Complex: Late Variant type to the west, and the Late Woodland pottery as described by Syms (1977) to the east. Meyer (1988:58-59) referred to a vessel from this site as having Old Women's Phase traits based on incised lines on the lip and shoulder.

A total of 12 vessels from the Garratt site were examined at the Royal Saskatchewan Museum (Table 23, Figure 30). Portions of Vessels 1 and 12 were on display in the gallery. Vessel numbers correspond to the vessels described in Morgan's (1979) report.

Table 23: Vessel data from the Garratt site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	VCR	Ext. expanding	Vertical	Angled	L: CWT; S: CWT
4	Textile Impressed	Expanding (both)	N/A		L: Gouge
5	VCR	Tapered	Angled		
6	Textile Impressed	Expanding (both)	Vertical		L: CWT
7	Roughened	Int. expanding	N/A		L: Punctate
8	Roughened	Int. expanding	Vertical		
9	Textile Impressed	Expanding (both)	N/A		L: CWT
11	VCR	Expanding (both), Ext. beveled	N/A		
12	VCR	Ext. beveled	Vertical		Paddle-edge
13	Textile Impressed	Expanding (both)	N/A		L: CWT
14	Textile Impressed	Int. expanding	N/A		L: Angular Impr.
16	VCR	Int. expanding	N/A		L: Incised Line

Figure 30: Profile drawings (left) and a photo of Vessel 12 (right) from the Garratt site.

Vessel 1 is the most complete vessel with a relatively straight rim and neck with an abrupt neck angle. The decorative CWT impressions were made using a very fine cord, possibly only a single thread of sinew. Unique cross hatched textile impressions on the surface finishes were noted throughout the assemblage. The gouge marks on the lip of Vessel 4 are in a zig-zag pattern. Lip punctates are rare in the Old Women's Phase assemblages analyzed in the current study. Vessel 12 (Figure 30) displays the unique paddle-edge surface decoration that has been attributed to the Hunter-Valley Edge-Paddled ceramic type (Walde et al. 2010). This type is described in more detail under the Hunter Valley site description. It has not been previously recognized in the Garratt site assemblages.

Grassy Lake Cairn - DlOv-1

The Grassy Lake Cairn is located on a high prominent landscape feature overlooking the South Saskatchewan River, east of the confluence of the Bow and the Oldman Rivers. The cairn was first reported in 1884 by George M. Dawson, but was soon subjected to small scale looting in the early 1900s (Forbis 1960:122; Wormington and Forbis 1965:121). Only weeks before the researchers from the Glenbow arrived, the site was substantially looted and the cairn partially destroyed. Forbis (1960) excavated the undisturbed fringes of the site and attempted to rebuild the turtle form, leaving in place the arms, legs, and tail. There are 100s of tipi rings in the vicinity and the Grassy Lake Medicine Wheel (DlOv-2) is located to the west.

Artifacts found at the site include lithic debitage, pipes, finger rings, beads, shells from the Pacific coast, and ceramic sherds. Griffin (1965:227) originally analyzed the ceramic artifacts from the site and noted attributes such as check-stamped, smoothed, and

fabric-impressed surface finishes, thumbnail impressions, and tiny punctates, one vessel has a flat base. Byrne (1973:128, 149, 651) used this material in his study of ceramics from southern Alberta, but did not include any of the check-stamped samples noted by Griffin. Rather, he identified truncated cord marked, truncated fabric/net-impressed, thick smooth, and woven fabric-impressed types.

Three vessels were assessed in detail at the University of Calgary (Table 24, Figure 31). Other vessels were present in the collection but were excluded from the current study if the temporal context of these vessels was undeterminable, they lacked diagnostic portions, or displayed attributes that did not match the Old Women's Phase pottery description. It was later recognized that this might have been unfortunate since many other assemblages seem to show a blending of traits.

Table 24: Vessel data from the Grassy Lake Cairn.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Element by Portion
1	Roughened	Ext. beveled	Vertical	Angled	
2	Roughened	Int. expanding	Vertical	Angled	
3	Roughened	Expanding (both)	Vertical		R: Finger Impr.

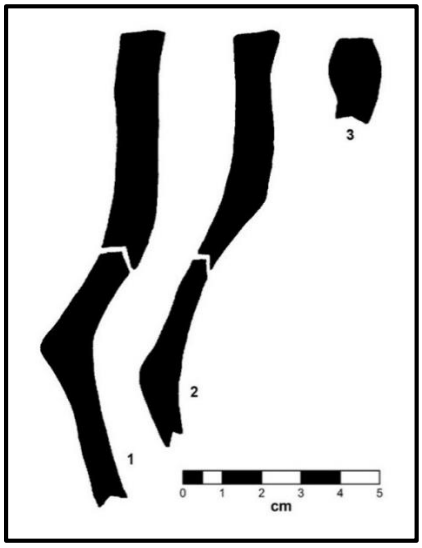


Figure 31: Profile drawings from the Grassy Lake Cairn.

Vessels 1 and 2 both have a tall, elongated rim and neck form with an angled shoulder. The only decorative element documented was finger impressions on the upper rim edge of a small portion of Vessel 3.

Gull Lake - EaOd-1

The Gull Lake site is a bison kill site located on the north edge of the Cypress Hills, approximately 10 km south-southwest of the Town of Gull Lake. Utilizing a deep coulee drop, bison were driven from the southeast to the north and down the side of the coulee (Kehoe 1973:9). Locals have long known about the site, but it was first recorded by the North Dakota State Historical Society Museum in 1948. Sixty-five potsherds and some lithic artifacts were recovered at that time (Kehoe 1973:11). Wettlaufer visited the site in 1951 and conducted test excavations in 1953. John Hodges led excavations in 1958 and 1959 and recovered two pottery vessels along with other material. These excavations were never reported on. Kehoe (1973) excavated the site in 1960 and 1963. He published a comprehensive book about the finds, which included descriptions of the two vessels from the Hodges Collection (Kehoe 1973:129, 124).

The earliest component at the site had a radiocarbon date of 1900±65 BP and is associated with an Avonlea campsite. The oldest bison drives were radiocarbon dated to 1740±60 BP and included associated Avonlea points. Kehoe (1973:39-40) noted that there was "a pattern of unburned whole bison bone overlying charcoal and heavily butchered bone scraps" overlaying these deep layers. Each of these patterned bone layers had distinct artifacts, starting with a combination of Avonlea and Prairie Side-notched, followed by only Prairie Side-notched, and then Plains Side-notched projectile points. All of these bone layers have distinct pieces of pottery.

A total of 206 sherds were recovered from the 1960 and 1963 excavations. The material was analyzed by Alice Kehoe in an unpublished report, which was later summarized by Thomas Kehoe (1973:118-125). She identified four styles of pottery. The earliest, *Gull Lake Cord-Impressed* pottery which radiocarbon dated to 1220±80 BP, was found with Avonlea and Prairie Side-notched projectile points. *Gull Lake Plain* pottery consisted of one identifiable vessel. The rim is straight and slightly flaring, the neck is constricted, and there is a distinct rounded shoulder. The surface finish shows an open weave fabric with a z-twisted cord that has been almost completely smoothed over. Although it does not have an associated radiocarbon date, the vessel is thought to date sometime between AD 1000 and 1200 based on the associated Prairie Side-notched projectile points. This style has been compared to vessels from sites in Manitoba and North Dakota (Kehoe 1973:123).

The third pottery style was called *Gull Lake Fabric-Impressed*. This vessel type consisted of one rim and three body sherds. The rim is fairly thin, but has a wide lip decorated with rows of cord or fabric-wrapped tool impressions oriented from the interior to exterior lip edges. The exterior surface finish has vertically oriented impressions that have been horizontally smoothed over leaving striations. Kehoe (1973:124) connected these sherds to Ethridge ware from Alberta and Montana. No radiocarbon dates were taken from this layer but based on the associated Plains Side-notched projectile points found in this latest occupation level, the date was estimated at 250 BP.

The fourth style was called *Gull Lake Incised* pottery. The four body sherds have curvilinear lines incised into the exterior fabric-impressed surface. These sherds were found in the same contexts as the Gull Lake Fabric-Impressed pottery (Kehoe 1973:123-

124). The two vessels from the Hodges collections were not assigned to any of these four categories but are described as being fabric-impressed with a complex profile and finger pinching along the lip (Kehoe 1973:124).

Twelve vessels from the Gull Lake site collection were examined at the Royal Saskatchewan Museum (Table 25, Figure 32). Most vessels could be referenced with the catalogue and associated with temporal data. Since all the vessels are associated with either Prairie or Plains Side-notched projectile points, or the Avonlea – Prairie Side-notched transition, they were all included in this study for comparative purposes.

Table 25: Vessel data from the Gull Lake site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Element by Portion	Approx. Date (BP)
1	VCR	Int. expanding	Vertical			850
2	VCR	Ext. beveled	Vertical			850
3	VCR	Expanding (both)	Flaring		L: CWT	250
4	VCR	Expanding (both), Ext. beveled	N/A			250
5	VCR	Squared	Vertical	Round	R: CWT; N: Cord Impr.	1220
6	VCR	Expanding (both)	Vertical		R: Angular Impr.	250
7	Roughened	Expanding (both)	N/A			250
8	Roughened	Int. flanged	Vertical			250
9	VCR	Squared	Vertical			250
10	Textile Impressed	Expanding (both)	Vertical		L: Angular Impr.	250
12	VCR	Ext. beveled	Flaring	Angled		

Figure 32: Profile drawings from the Gull Lake site.

Vessel 5 (Gull Lake Cord-Impressed*)* is associated with the oldest occupation of the site. It displays vertical CWT impressions on the interior and exterior of the upper rim edge. Below this, there are at least six rows of horizontal cord impressions. This horizontal decorative feature is also seen on the Tschetter site vessel also associated with the transition from Avonlea to the Old Women's Phase. The thick CWT impressions on the lip surface of Vessel 3 (Gull Lake Fabric-Impressed) is common throughout Old Women's Phase assemblages. The exception is that the vessel wall is incredibly thin, ranging from 5.2-8.1 mm thick. The lip has a distinct T-shape, which is uncommon. Vessel 12, labelled as Wascana ware, was examined in the gallery of the Royal Saskatchewan Museum. This vessel matches the descriptions of Gull Lake Plain pottery, estimated between AD 1000 and 1200 BP. However, Wascana ware is now considered part of the northern variant of the Mortlach Phase (Malainey 1991; Walde 2003). This vessel was included in this study in order to compare the similarities of the attributes with Old Women's Phase pottery. It shares similar traits, though less frequent, with other

vessels in this study, such as a straight, flaring rim, sharply angled neck, and a distinct shoulder.

Head-Smashed-In Buffalo Jump - DkPj-1

Head-Smashed-In Buffalo Jump is a multi-component buffalo jump, processing, camp, and kill site located on the edge of the Porcupine Hills, 18 km northwest of Fort Macleod. Numerous studies and excavations have been conducted at this site starting with Junius Bird in 1938, followed by Boyd Wettlaufer in 1949, Reeves (1978, 1983a), Vickers (1983), Brink et al. (1985, 1986), Brink and Dawe (1989), Kooyman (1990), and Damkjar (1995). The jump has been in use since 5500 BP and includes cultural deposits from the Mummy Cave complex, Pelican Lake, Besant, Avonlea, and Old Women's Phase time periods. Scottsbluff points were found near the base of the jump, though it is likely that these artifacts were deposited prior to the use of the jump site. Local Blackfoot communities have strong connections to the site.

There was little focus on the processing and campsite areas until the excavations in the 1980s (Brick et al. 1985:60). These areas contained butchered bone, pit features, hearths, stone circles, lithic debitage, bone uprights, stone tools, hundreds of projectile points, and ceramic sherds. Radiocarbon samples from different levels of the processing area yielded dates ranging from 1300±70 BP to 360±180 BP (Brink and Dawe 1989:26-27); though correlating specific artifacts with dated contexts was problematic because of the compact stratigraphy. Since the ceramic bearing cultural levels were collapsed into 20-30 cm, the ceramics are considered a mixed assemblage (Hanna 1986:426-427).

The majority of the ceramic artifacts found at the site were recovered from the processing and campsite areas and most sherds are too fragmented to warrant detailed

analysis. Byrne (1973:100, 300, 341, 651) used 15 rim, 4 neck, and 6 body sherds recovered from Reeves' (1983a) 1965-66 excavations in his study. He assigned these sherds to all three of his classification types: Saskatchewan Basin Complex: Early and Late Variants and Cluny Complex. Material described from this collection displays brushed/combed, vertical cord-impressed, and fabric-impressed surfaces. Decorative elements include fingernail impressions and oblique linear impressions on the lip and rim (Byrne 1973).

At least 390 sherds were found in the 1980s, though very few are diagnostic. One notable sherd is highly decorated with uneven tiny punctates, vertical notches, and horizontal incised lines. Brink et al. (1986:101-103) suggested that an inexperienced potter may have made this vessel. Other sherds display fabric and cord-impressed surfaces with decorative elements consisting of impressions from fingernails, dentates, and oblique linear tools (Brink et al. 1985:213-14; Brink et al. 1986:101-103; Brink and Dawe 1989:279-284). Hanna (1986:404-428) conducted a technological assessment of the mineralogy of the clays used to make the ceramics. She determined that four different clay sources were used, but only one could be sourced to a deposit along a tributary of the Oldman River, 6 km southwest of the site.

Damkjar (1995:64) recovered a large portion of a vessel associated with Avonlea cultural material. This vessel was reconstructed into a conical form with no distinct neck or shoulder. It has a partially smoothed fabric-impressed surface and four rows of small finger pinches on the rim, followed by a row of punctates. This vessel has been referred to as the Head-Smashed-In Pot and is used by Walde and Meyer (2003:139-140) as an example of Rock Lake Net/Fabric Impressed ware defined for the Avonlea period.

Five vessels were examined at the University of Calgary (Table 26, Figure 33). These vessels were also part of Byrne's (1973) analysis.

Table 26: Vessel data from the Head-Smashed-In Buffalo Jump.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Element by Portion
1	Brushed	Int. expanding	Vertical	Angled	
2	VCR	Expanding (both)	N/A		R: Fingernail Impr.
3	N/A	Expanding (both)	N/A		L: Linear Impr.; R: Incised Line
4	Smooth	Ext. expanding	Vertical		R: Angular Impr.
5	Smooth	Tapered	Vertical		

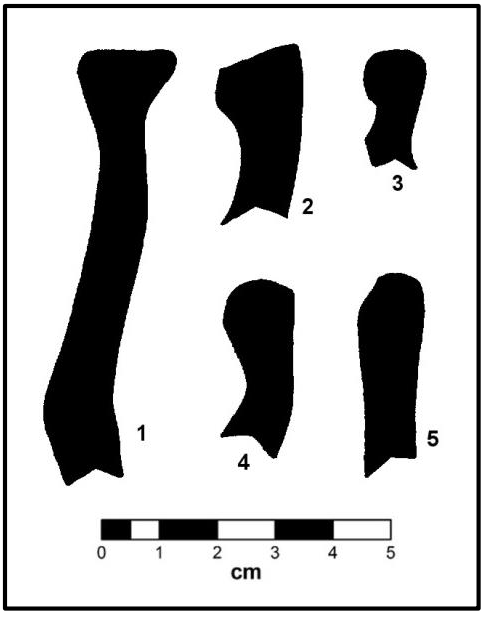


Figure 33: Profile drawings from the Head-Smashed-In Buffalo Jump.

A photograph of Vessel 1 is provided by Byrne (1973:716, Plate 14a). This vessel has a tall elongated neck and rim with an angled shoulder. The brushed surface on this vessel is more frequently seen in Cluny ceramic assemblages. The finger impressions on the rim edge of Vessel 2 is a reoccurring trait in the Old Women's Phase assemblages. Vessel 3 has unique oblique linear impressions on the round lip surface, below which is a horizontal incised groove on the rim. This trait is not found on any other vessels in the current study.

Hunter Valley - EiPp-16

The Hunter Valley site is a processing and campsite located on the south side of an unnamed tributary of Beaverdam Creek, approximately 18 km south of Cochrane. Head (1994:63-71) first identified the site in 1993 by a shovel testing program related to a pipeline project that resulted in a 135m² excavation in 1995 (Head 1999).

Head (1999) identified two occupation levels within the first 30 cm below surface. The earliest component, a Besant occupation level, yielded a radiocarbon date of 1260±60 BP (Head 1999:31, 62-64). Occupation 2 is associated with 31 late period projectile points, a variety of other stone tools, the remains of at least four large mammals, a rock lined hearth feature, and ceramics (Head 1999:67). Concentrations of ceramic material were located between 2-9 m from the hearth feature. Samples for radiocarbon dating came from organic residues inside two of the vessels. They yielded overlapping dates of approximately 415 BP (Head 1999:31).

The ceramic assemblage is made up of at least three vessels, all clustered in different areas of the site (Head 1999:95). Walde (1999:216-237) conducted the original analysis of the ceramics and identified a distinct pattern of impressions on the surface, particularly on the body of the vessels. He attributed these impressions as the side of a cord-wrapped paddle (Walde 1999:229). Finger pinching is found on all of the shoulders. One vessel has incised lines on the exterior lip corners and another has hollow punctates around the lip surface.

This collection was examined at the Royal Alberta Museum (Table 27, Figure 34). The neck and shoulder of a fourth vessel was reconstructed and added to the analysis.

Table 27: Vessel data from the Hunter Valley site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Element by Portion
1	VCR	Interior expanding	Vertical		
2	GCR	Interior beveled	Flaring	Angled	L: CWT; S: Pinch; Paddle-edge
3	VCR	Expanding (both)	Vertical	Angled	L: Hollow Impr.; R: Linear Impr.; S: Pinch; Paddle-edge
4	VCR			Angled	S: Pinch

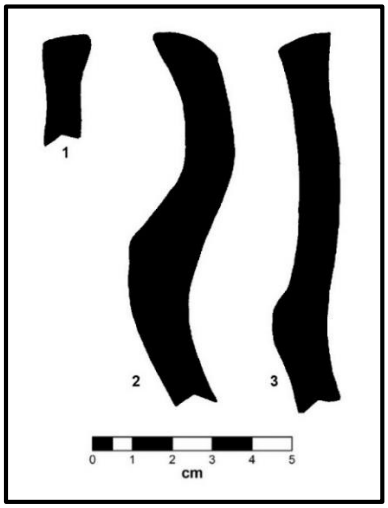


Figure 34: Profile drawings from the Hunter Valley site.

Walde (1999:235) initially compared these vessels to Sandy Lake ware and suggested a new archaeological phase based on the distinct surface decoration from the side of a cord-wrapped paddle. He has since identified this pottery at other sites, including EkPf-1 (Rumsey Cairn) and EfPk-1 (FM Ranch Campsite), and defined it as the *Hunter Valley Edge-Paddled* type (Walde et al. 2010:157). Although these vessels were excluded from the Ethridge ware and Saskatchewan Basin Complex: Late Variant debate, they were added to the current analysis in order to compare vessel attributes.

Vessel 3 has a tall neck and rim with an angled and pinched shoulder similar to other Old Women's Phase assemblages. However, the hollow impression on the lip surface and the paddle-edge surface decoration separates it from others with this form.

Junction - DkPi-2

The Junction site is a bison kill, processing, and campsite situated along Spring Ridge, 2 km west of Fort Macleod and less than 1 km south of the Oldman River. Locals have known about the site since the 1920s. It has been extensively looted and was mined for bone to use as fertilizer and charcoal filters (Unfreed and Van Dyke 2005:6). Two full scale mitigative excavations were conducted for transportation projects relating to Highways 2 and 3 (Reeves et al. 1981; Unfreed and Van Dyke 2005). Smaller scale assessments have also been done at the site. The two main areas of the site are the upper prairie surface and the lower terrace. Most of the research has focused on the processing area on the lower terrace.

The original excavators identified six cultural layers beginning with Avonlea, followed by Old Women's Phase cultural material (Reeves et al. 1981:6-8). No ceramics were recovered from these excavations. The excavations conducted in the early 1990s were west of the original excavations and only Old Women's Phase material was identified. These occupation levels were grouped into Components I - III, from oldest to youngest. Based on the average of 34 radiocarbon dates, Component I dates to approximately 800 BP and Component II to 500 BP. Component III was associated with the modern, historic surface (Peck 2011:390; Unfreed and Van Dyke 2005:40). Cultural material found at the site consists of massive amounts of bison bone, some deer and dog bone, fresh water clam, projectile points with a general trend from Prairie to Plains Side-notched styles, other stone tools, lithic debitage, FBR, and ceramics. Features include roasting pits and hearths, some of which were filled with rock and bone (Reeves et al. 1981; Unfreed and Van Dyke 2005).

Walde (2005:302-311) completed the ceramic analysis of the sherds recovered from the 1991-92 assessments. He identified a total of 28 vessels from the site, 23 of which were examined at the Royal Alberta Museum (Table 28, Figure 35).

Table 28: Vessel data from the Junction site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	VCR	Expanding (both)	Vertical	Round	L: Linear Impr.
2	Smooth	Int. expanding	N/A		
3	Smooth	Ext. expanding	Vertical	N/A	
4	Stamped	Int. expanding	Vertical		
5	Roughened	Subround	Vertical		
6	VCR	Expanding (both), Ext. beveled	N/A		
7	VCR	Expanding (both), Ext. beveled	Vertical		
8	GCR	Expanding (both), Ext. beveled	N/A		
9	Roughened	Expanding (both), Ext. beveled	Vertical		
11	Roughened	Ext. beveled	Vertical		
12	N/A	Ext. beveled	Flaring		
13	Smooth	Ext. beveled	N/A		
14	Roughened	Round	Vertical		
15	Roughened	Int. expanding	Vertical		
16	Roughened	Expanding (both), Ext. beveled	Flaring		
18	GCR	Int. expanding, Ext. beveled	Vertical		
19	GCR	Exterior beveled	N/A		
20	N/A	Round	N/A		
23	Smooth	Round	Vertical		
24	N/A	Tapered	Vertical		
27	Smooth	Round	N/A		
28	Roughened	Int. expanding, Ext. beveled	Flaring		
29	Roughened	Tapered	N/A		

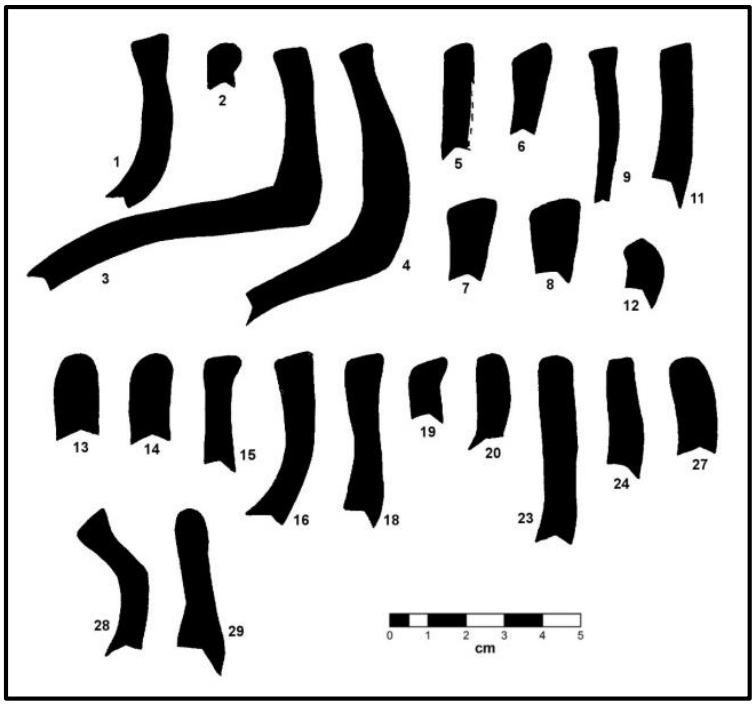


Figure 35: Profile drawings from the Junction site.

Surface finishes include vertical cord-impressed, smoothed, and generally roughened. Vessel 4 displays a check-stamped finish which stands out from the rest of the assemblage because this trait was thought to only occur in Cluny or Mortlach ceramic assemblages (Walde 2005:304-305, 310-311). This vessel was found mixed with Components I and II artifacts (Unfreed and Van Dyke 2005:75). Only Vessel 1 displays decorative elements including linear impressions in a zig-zag pattern on the lip surface. Walde (2005:312-315) was unable to detect any significant differences between the vessels relating to Component I and II. In a preliminary petrographic analysis of seven vessels he concluded that certain vessels shared similar paste and mineral content while others had unique signatures.

Walde (2006a) compared the Little Bow ceramics with the Junction site assemblage and noted that the collections were distinctly different in rim heights and lip

thicknesses. He suggested the *Junction Narrow Lip* type to emphasize the thin lips, ranging from 6.5-10.5 mm, and tall rims, ranging from 17-34 mm.

Several vessels throughout the Old Women's Phase were identified in this current study that have a very straight rim with a sharp angled neck. It is possible that in addition to differences in the lip thicknesses, the neck angle is also a distinguishing feature that separates this collection from other Old Women's Phase assemblages.

Kenney - DjPk-1

The Kenney site is a multi-component campsite in southwestern Alberta located along the southeast bank of the Pincher Creek, approximately 1.6 km west of Brocket. The site is situated on a single terrace (the Kenney Terrace) of a four-terrace system. It was first surveyed by Forbis in 1958 and Reeves (1983b) subsequently excavated the site in 1963 and 1964. Three major occupations were noted, not including the most recent Protohistoric and Historic Period occupation levels. The oldest occupation levels contained Besant projectile points. Reeves (1983a, 1983b) used the Kenney assemblage as a key site in his interpretation of the Besant Cultural Phase. Avonlea projectile points were also recovered from the second occupation level and have been used to mark the transition from the atlatl to the bow and arrow (Reeves 1983b:128). The youngest prehistoric occupation level yielded a radiocarbon date of 355±60 BP. A total of 19 projectile points were recovered from this level and were originally assigned as Plains Triangular, Paskapoo, Nanton, and Lewis Side-notched point types based on Forbis' (1962) classification system (Reeves 1983b:72).

A single ceramic vessel was recovered from the latest prehistoric level, consisting of eight rim and 284 body sherds. Reeves (1983b:3-4, 123-125) classified the vessel as

Manitoba Corded (Blackduck) ware based on similarities noted by MacNeish (1958) and Evans (1961). He noted similar decorative techniques to Ethridge ware, such as punctates and CWT impressions on the lip, but stated that the ceramics found at the Kenney site are different because they do not look similar to the ceramics described by Forbis (1960) from the Ross site. Byrne (1973) used this vessel in his study yet did not discuss Reeves' interpretation when he placed the Kenney site ceramics into his Saskatchewan Basin Complex: Late Variant category.

This vessel was examined at the University of Calgary. It can be generally described as having a vertical cord-impressed surface finish, globular body and base with a mild neck constriction, and a tall, long neck and rim (Figure 36). Decorative elements include right-oblique oriented CWT impressions on the lip surface and irregular shaped punctates on the neck. This is the thinnest vessel identified in the current study and the irregular shaped punctates are unique.

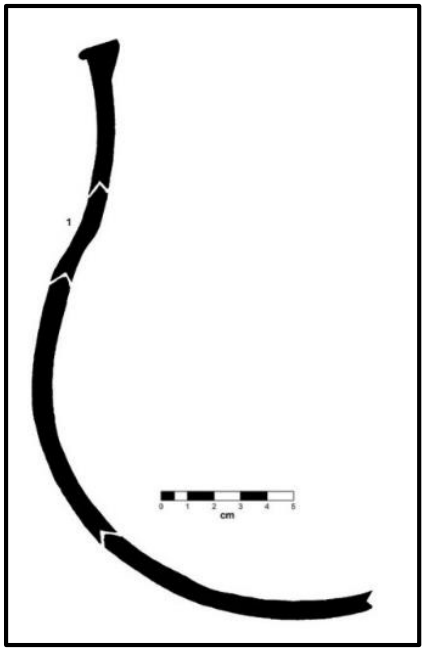


Figure 36: Profile drawing from the Kenney site.

Little Bow - EaPh-4

The Little Bow site is a multi-component campsite located on a high landform along the north-west bank of the Little Bow River overlooking the lower plains to the east and south. Gryba (1984:11-13) first identified the site through a proposed bridge crossing survey that resulted in backhoe and shovel tests. Mitigative excavations followed and two occupation levels within the top 20 cm were identified (Fedirchuk 1985:1-96). When the bridge construction began, the bulldozer uncovered additional material which was surface collected by the University of Calgary (Fedirchuk 1986).

Both levels had similar types of artifacts, including notched projectiles points, various other stone tools, lithic debitage, ceramics, petrified wood, FBR, and faunal remains. Features included a rock concentration in a shallow pit, an excavated hearth, and a series of six bone uprights. The upper (Carmangay) component yielded a radiocarbon date of 620±230 BP and the lower (Vulcan) component had a date of 450±70 BP (Fedirchuk 1986:43-44). The levels were separated by approximately 5 cm of lighter brown soil with fine grained clay and medium to fine grained sand. Due to the overlapping standard deviation of radiocarbon dates, it is likely a similar group of people used the site relatively close in time, around 500 BP. A few cultural remains were found below these levels, none are diagnostic.

A total of 12 vessels from the site have been identified. Vessels 1-8 were found during the excavation and Vessels 9-12 were surface collected after the bulldozer striped away the Carmangay level. It is possible that these vessels were associated with the Vulcan component but this cannot be confirmed (Fedirchuk 1986). Vessels 2, 4, and 5 were from the Carmangay component, Vessels 7 and 8 from the Vulcan component, and sherds from Vessels 1, 3 and 6 came from both, suggesting some degree of mixing.

Surface finishes include smoothed and very parallel, widely spaced vertical cord impressions. Decorative elements include cord-wrapped tool impressions on the lip surface and large punctates on the rim. Fedirchuk (1985:60-61) noted that these vessels share both Saskatchewan Basin Complex: Late Variant and Cluny Complex traits. She also found that the attributes strongly resemble Dawson's (1977:170) Blackduck Ceramic Tradition from the Eastern Woodlands region. Fedirchuk (1986:88) cautioned assigning cultural affiliations to the site reflecting that the tendency to link Old Women's Phase components with Blackfoot cultures warrants reconsideration.

Vessels 1, 2, 4, 5, 7, 9, 10, and 11 were examined at the Royal Alberta Museum (Table 29, Figure 37). The remaining four vessels were recorded in the database based directly on Fedirchuk's (1986) published data.

Table 29: Vessel data from the Little Bow site.

Vessel	Surface Finish	Lip	Rim	Decorative Elements by Portion
1	Smooth	Expanding (both), Ext. beveled	Vertical	L: CWT; R: Punctate
2	N/A	Ext. expanding		L: CWT; R: Punctate
3	Smooth	N/A	N/A	
4	Smooth	Expanding (both), Ext. beveled	Vertical	R: CWT
5	VCR	Ext. flanged	Vertical	
6	VCR	Ext. beveled	N/A	R: Incised Line
7	VCR	Ext. flanged	Vertical	
8	N/A	N/A	N/A	R: Incised Line
9	VCR	Ext. flanged	Vertical	
10	VCR	Ext. flanged	Vertical	
11	Smooth	Round	Vertical	R: Punctate
12	N/A	Ext. beveled	N/A	L: Linear Impr

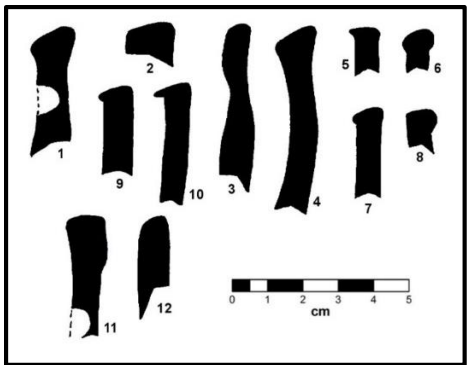


Figure 37: Rim profile drawing from the Little Bow site.

The punctates found on Vessels 1 and 11 are less frequent in the Old Women's Phase assemblages than previously suggested by Byrne (1973). The flanged lip forms in this collection are also quite rare. None of these vessels have a neck or shoulder present so a more complete profile description is not possible. Vessel 4 appears to have a relatively common tall neck and rim with a mild curve. However, this vessel is unique due to the vertical CWT impressions on both the interior and exterior of this upper rim edge.

Miry Creek – EeOc-5

The Miry Creek site is located next to Lake Diefenbaker, a reservoir on the South Saskatchewan River. It is a multi-component site with mixed assemblages from the Middle Prehistoric, Late Prehistoric, Protohistoric, and Historic Periods. Like the Antelope Creek collection, most of the artifacts are part of the private Heron Collection that was analyzed by Novecosky (2003). Froese (1984) conducted a small excavation, mapping, and survey project in 1983 and 41 separate activity areas were identified, however, no report is available (Novecosky 2003).

Malainey (1991) included 20 ceramic vessels from Miry Creek in her assessment of Mortlach pottery and 114 additional vessels were made available for Novecosky

(2003:23). Out of the 134 vessels, 30 were assigned to the Old Women's Phase (Novecosky 2003:100) (Table 30, Figure 38). Due to the mixed context, it is possible that the Mortlach and Old Women's Phase pottery were incorrectly classified as these Mortlach vessels are very similar to other ceramics used in this research.

Table 30: Vessel data from the Miry Creek site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	VCR	Int. Expanding, Ext beveled	Vertical		
2	VCR	Expanding (both), Ext. beveled	N/A		
3	Smooth	Tapered	N/A		
4	Smooth	Subround	N/A		
5	VCR	Int. expanding	Vertical		
6	GCR	Squared	N/A		R: Cord Impr.
7	N/A	Int. flanged	N/A		L: Dentate
8	VCR	Expanding (both)	N/A		L: Incised Line
9	VCR	Squared	Constricted		L: CWT
10	N/A	Expanding (both)	N/A		L: CWT
11	N/A	Int. flanged	N/A		L: Linear Impr.
12	VCR	Squared	N/A		
13	Smooth	Ext. expanding	N/A		L: Linear Impr.
14	VCR	Expanding (both)	N/A		R: Angular Impr.
15	Roughened	Expanding (both)	Vertical		R: CWT
16	N/A	Expanding (both)	N/A		R: Incised Line
17	VCR	Squared	Vertical		R: Fingernail Impr.
18	VCR	Tapered	Vertical		R: CWT
19	Smooth	Expanding (both)	N/A		R: Fingernail Impr.
20	VCR	Int. expanding, Ext beveled	N/A		R: CWT
21	N/A	Tapered	N/A		R: CWT
22	N/A	Int. flanged	N/A		R: CWT
23	VCR	Int. beveled	Vertical		L: Dentate; R: Irreg. Punctate
24	Smooth	Int. expanding	N/A		L: Dentate; R: Finger Impr.
25	Smooth	Int. expanding	N/A		R: Angular Impr.
26	VCR	Exterior beveled	N/A		L: CWT and Angular Impr.
27	Roughened	Interior expanding	N/A		R: Angular Impr.
28	N/A	Expanding (both)	Flaring		R: Angular Impr. and Incised Line
29	VCR	Exterior beveled	Angled	Angled	L: Linear Impr. and CWT; R: Cord Impr.
30	VCR	Exterior beveled	N/A		R: Pinch

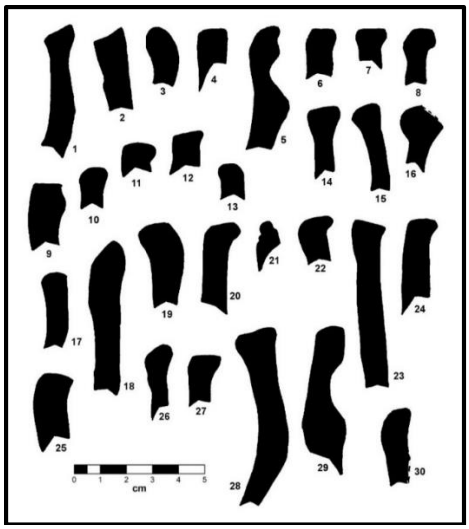


Figure 38: Rim profile drawings from the Miry Creek site, adapted from Novecosky (2003).

Morkin Buried Camp - DlPk-2

The Morkin site is a multi-component buried campsite on the lower terraces of Trout Creek. Forbis conducted the first tests at the site in 1967 and were followed by full excavations in 1967, 1968, and 1970. Although a detailed site report has never been written, Byrne (1973) described many features of the site and used it as a comparative example for other ceramic bearing sites in southern Alberta.

A total of five cultural levels were identified starting with the Besant Phase, followed by Avonlea, two from the Old Women's Phase, and a Protohistoric component (Byrne 1973:252; Peck 2011:440). Radiocarbon dates ranged from 1340±130 BP to 105±90 BP (Byrne 1973:252). Levels were originally excavated following the natural stratigraphy but changed to 10 cm arbitrary levels because of the stratigraphic mixing (Byrne 1973:16). Byrne (1973:241) used these levels for general chronological ordering only. Over 100 hearth features, bone concentrations, pits, and bone uprights were identified at the site (Byrne 1973:608).

Approximately 3800 ceramic sherds were found at the Morkin site and Byrne (1973) analyzed 2310 sherds in detail. He divided the collection into 71 vessels which he grouped into Saskatchewan Basin Complex: Early and Late Variants, and the Cluny Complex using attribute frequencies. Byrne (1973) used these frequencies to classify other pottery found in southern Alberta.

For this study, a sample of 16 vessels from the Morkin assemblage was examined at the Royal Alberta Museum (Table 31, Figure 39). These vessels were chosen because they were thought to belong to the Old Women's Phase but it is likely that some Saskatchewan Basin Complex: Early Variant and Cluny Complex vessels were included.

Table 31: Vessel data from the Morkin site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	Smooth	Ext. expanding	Flaring	Round	
2	Smooth	Round	N/A		L: Gouge
3	VCR	Expanding (both)	N/A		
4	Smooth	Tapered	Vertical		
5	GCR	Expanding (both), Ext. beveled	Vertical		R: Hole
6	GCR	Int. expanding	N/A		R: Hole
7	Smooth			Angled	
8	Smooth	Expanding (both)	N/A		
9	Roughened	Expanding (both)	Vertical		R: Angular Impr.
10	Knotted Cord Impressed	Ext. expanding	Vertical		R: Boss and Punctate
11	Smooth	Int. expanding	Constricted	Round	
12	Roughened	Int. flanged	Flaring		R: Linear Impr. and Irreg. Punctate
13	Smooth	Ext. flanged	Constricted		
14	Smooth	Int. expanding	Constricted		
15	Brushed	Int. flanged	Vertical		
16	Brushed	Ext. expanding, Int. beveled	Vertical		L: Dentate

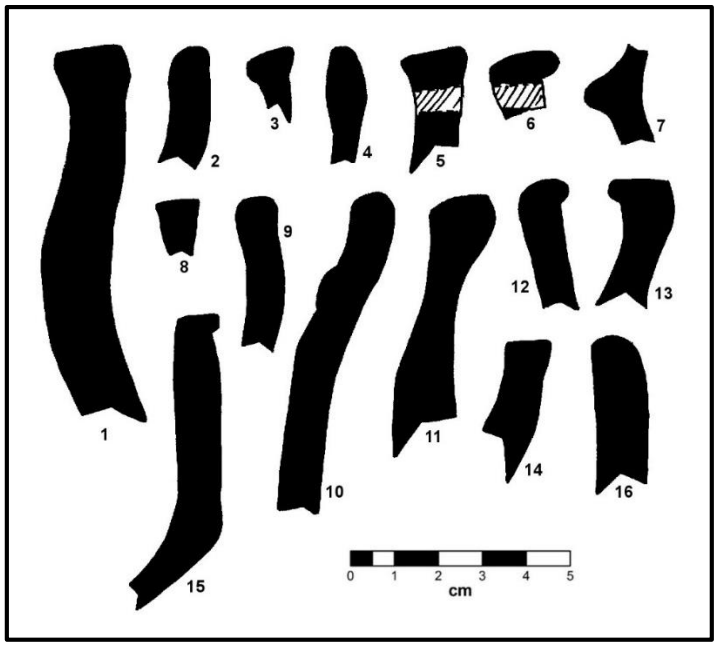


Figure 39: Vessel profile drawings from the Morkin site.

Many of the vessels in the Morkin sample display rare or less frequent attributes compared to other Old Women's Phase sites. For example, the boss on the constricted rim of Vessel 10 and the holes in Vessels 5 and 6. It is possible that Vessels 5 and 6 represent the same vessel. The decoration on the lip surface of Vessel 2 consists of interlocking square gouges that cut in from the interior and exterior. The brushed surfaces of Vessels 15 and 16 and the dentates on the lip surface also indicate that these vessels are not typical of Old Women's Phase pottery. Vessel 1 displays a short rounded neck and rim, with a round, globular shoulder and body. This vessel and several smaller lip forms may be the only representatives of Old Women's Phase ceramics from this site.

Old Women's Buffalo Jump - EcPl-1

The Old Women's Buffalo Jump was named as such because of the Blackfoot story about when men and women first started to live together. It is one of two possible sites that may have been the original women's location (Forbis 1962:61). Forbis (1962)

conducted the only systematic excavations at the site. He separated the excavations into the Upper and Lower Pit areas, and further divided the Upper Pit into the Upper Member (Levels 1-14) containing arrow points and the Lower Member (Levels 15-30) containing dart (atlatl) points (Forbis 1962:74).

The site was continuously used for nearly 2000 years. Due to the undisturbed contexts of deposits, Forbis (1962) was able to use the projectile points from the site to build a general chronology of point styles in the area. Although not every researcher follows his classification scheme, this collection has been used in subsequent studies on projectile point typology (Kehoe 1966; Peck 1996; Peck and Ives 2001; Reeves 1983a).

A total of four potsherds were recovered from the site, likely from Level 5 (Forbis 1962:118). The sherds were originally described as having a slightly smoothed vertical cord-roughened surface finish, with fingernail impressions on the outer lip corner and fingernail pinches on the shoulder. Forbis (1962) referred to the pottery as Ethridge ware as defined by Kehoe (1959). When Byrne (1973:654) classified the pottery, he identified a check-stamped surface finish on one body sherd and assigned it to the Cluny Complex.

Only the rim sherd with fingernail impressions on the upper rim edge and a vertical cord-impressed body sherd were able to be examined at the University of Calgary (Figure 40); the shoulder sherd with fingernail pinches and the check-stamped body sherds could not be located. It is likely that ceramic artifacts from this site are in private collections.

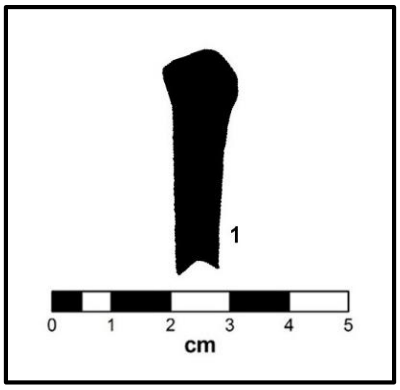


Figure 40: Rim profile drawing from the Old Women's Buffalo Jump.

Piché Pot - DkNv-15

DkNv-15 consists of a single ceramic vessel that was found on cultivated farmland south of Notukeu Creek and northwest of Pinto Creek in southwestern Saskatchewan (St. Cyr 1993). Sherds of the vessel had been collected between 1981 and 1985 by the landowner, Roger Piché. He contacted Henri Liboiron, an avocational archaeologist, in 1985 who then excavated the area where sherds were found. No other artifacts were found associated with the vessel. A total of 199 sherds make up what has been referred to as the Piché Pot (St. Cyr 1993).

St. Cyr's (1993) data on the Piché Pot were used in the current study. The vessel has a vertical cord-roughened surface, a curved and flaring neck and rim, and a round, globular shoulder and body (Figure 41). St. Cyr (1993:29) reported that the vessel has a flattened bottom but this cannot be confirmed in the photos. Right oblique angular impressions are displayed on the lip surface and appear to be spaced approximated 7 cm apart.

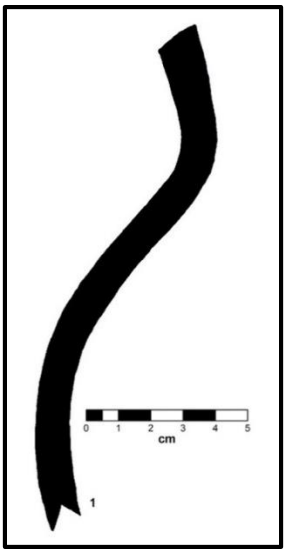


Figure 41: Profile drawing of the Piché Pot, adapted from St. Cyr (1993:29-32).

Pouliot

The Pouliot site a prehistoric campsite located on a bench feature on the south fork of the Milk River, just south of the Alberta – Montana border near the town of Cutbank. An abundance of artifacts in association with tipi rings were found in the area (Johnson 1975:63). Gordon Pouliot discovered a complete ceramic vessel eroding out of the north bank of the river. A hammerstone, two vertebra, and mandible fragments were found inside the vessel (Johnson 1975).

The vessel does not fit within a defined ceramic tradition because the walls are very thick with coarse granite temper and it is lacking a distinct shoulder. It does display a smoothed vertical cord-roughened surface, a flaring rim, and a rounded base. This vessel was included in this analysis in order to compare one of the few documented vessels found in northern Montana. If it had CWT impressions on the rim, it would be very similar to the early vessel from the Corey Ranch site.

Data for the current analysis were acquired from Johnston's (1975) descriptions (Figure 42).

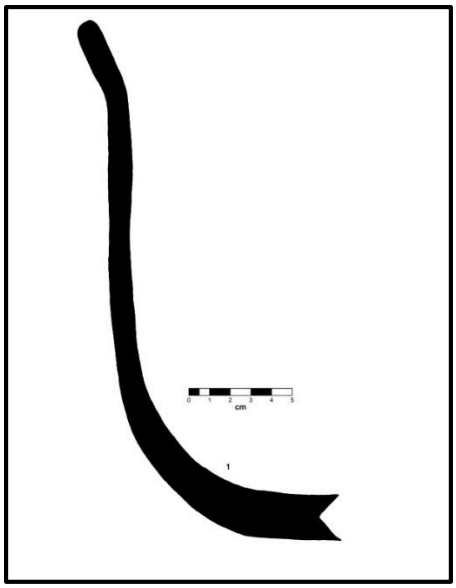


Figure 42: Vessel profile drawing from the Pouliot site, adapted from Johnson (1975:65, Figure 1).

Ross - DlPd-3

The Ross site is a buried campsite located on a low terrace along the south bank of the Oldman River, approximately 4 km west of the confluence with the Little Bow River. The terrace has been eroded by alluvial activity which has exposed several occupation layers, all of which are associated with the Old Women's Phase (Forbis 1960; Peck 2011:393). The site was buried by four feet of sands and gravels deposited by floods in the Historic Period (Forbis 1960:121). Forbis (1960) identified three occupation levels in his excavations he referred to as Layers I, II, and III, from bottom to top, separated by sterile deposits of alluvium. Vickers (1989:25) revisited the site in 1980 and noted nine layers containing cultural material. Artifacts recovered from the site include pottery, beads, pipe fragments, bone tools, a variety of stone stools, debitage, and faunal material.

Forbis (1960:121) suggested that the Ross site could have been used as a winter camp. Chinooks in the region and the presence of cottonwood for fuel and shelter would have made it suitable for a winter occupation. It is likely that this was the campsite

associated with the Upper and Lower Kill sites, which are located approximately one kilometre to the south. Wormington and Forbis (1965:140) suggested that the site was occupied by the same group of people that used the site intermittently over a short period of time based on the similarities of the artifacts between the cultural layers. This can be further corroborated by the tight radiocarbon dates: Layer II being 540±135 BP and Layer III (the top most layer) being 615±120 BP. These dates have an overlapping standard deviation and the approximate date for both occupations is 580 BP (Morlan n.d., in Peck 2011:384-385, 393).

A total of 699 ceramic sherds were recovered in 1957: an estimated seven vessels (Forbis 1960:124-125). Only 14 sherds were recovered in 1980 (Vickers 1989:119). Ceramics at the site showcase a range of surface finishes and distinct decorative elements. The single ceramic vessel recovered from Layer II is nearly identical to one found in Layer III. Both vessels have finger pinches and impressions on both the rim and shoulder. Forbis (1960:124-126) noted remarkable similarities between the Ross site assemblage and the ceramics identified at the Galata site along the Marias River and the Ethridge site, both of which are in Toole County, Montana. Other vessels found in Layer III have fabric-impressed surfaces and one may be basket-impressed. The fabric-impressed surfaces were compared to Winnipeg Fabric-Impressed wares described by MacNeish (1958:162-169).

Seventeen distinct vessels were examined for this study (Table 32, Figure 43). Collections were housed at the Royal Alberta Museum and the University of Calgary. Similar vessels were separated based on paste and rim profile. Since Forbis (1960)

estimated there were only seven vessels in the assemblage, it is likely that similar surface finishes were grouped together.

Table 32: Vessel data from the Ross site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	VCR	Ext. expanding	Vertical	Angled	R: Pinch; S: Pinch
2	VCR	Ext. expanding	Vertical	Angled	R: Pinch
3	VCR	Ext. expanding	Vertical		R: Pinch
4	Knotted Cord Impressed	Expanding (both), Ext. beveled	Flaring	Round	
5	VCR	Int. expanding	Constricted		
6	Smooth	Ext. expanding	N/A		
7	VCR	Int. Expanding, Ext. beveled	N/A		
8	VCR	Expanding (both)	Vertical	Round	L: Linear Impr.
9	Dimpled	Expanding (both)	Vertical		
10	Dimpled	Expanding (both), Ext. beveled	Vertical		
11	VCR	Int. Expanding, Ext. beveled	Vertical		
12	VCR	Expanding (both), Ext. beveled	Vertical		R: Pinch
13	Smooth	Ext. expanding	Flaring		R: Hollow Impr.
14	Roughened	Expanding (both)	N/A		R: Cord Impr. and Tiny Punctates
15	N/A	Int. Expanding, Ext. beveled	N/A		
16	Roughened	Expanding (both), Ext. beveled	N/A		
17	VCR	Squared	N/A		

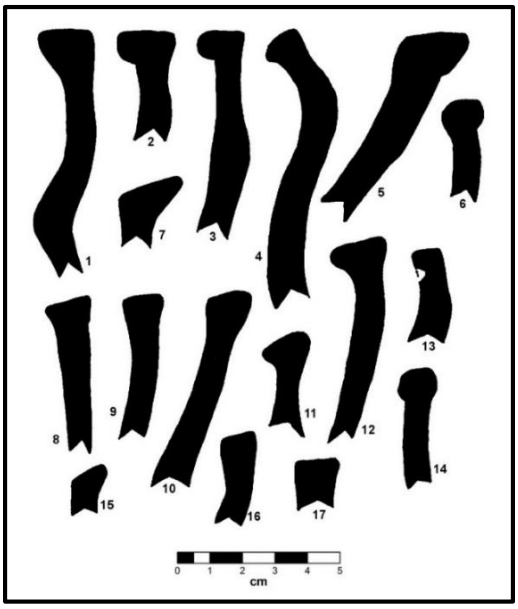


Figure 43: Vessel profile drawings from the Ross site.

The tall rims and necks, angled shoulders, and decorative finger marks are common characteristics throughout the Old Women's Phase assemblages. The short curved rim and neck of Vessel 4 is also not uncommon. However, as with many other site assemblages, several unique vessels stand out. Vessel 13 has a hollow punctate on the rim and Vessel 14 displays unevenly spaced tiny punctates.

Rumsey Cairn - EkPf-1

The Rumsey Cairn and Medicine Wheel is a large stone ring with a central rock pile. An anthropomorphic effigy figure, recorded as EkPf-2, is associated with the cairn. Locals have known about of the site for some time and it was first excavated by amateurs in the 1930s. The recovered artifacts are now in private collections (Forner 2006; Turny 2005). Forbis visited the site in 1958 and, subsequently, the Glenbow Foundation excavated in 1961. Although no report was ever published, the field notes by King (1961) are referenced in several CRM reports (Forner 2006; Turny 2005).

Only two vessels were identified at the University of Calgary (Figure 44, Table 33,). Walde et al. (2010) included Vessel 2 in the distribution of the Hunter Valley Edge-Paddled type based on the short, undulating cord-wrapped paddle impressions.

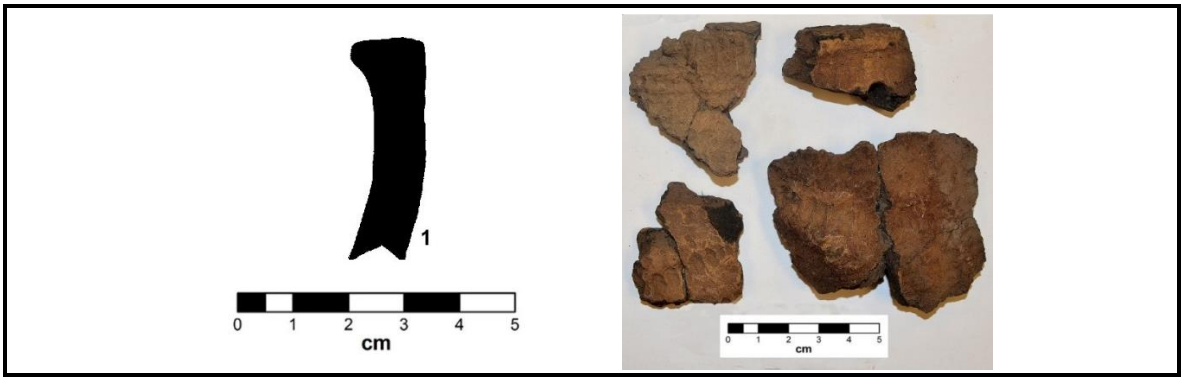


Figure 44: Profile drawing of Vessel 1 (left) and a photo of Vessel 2 (right) from the Rumsey Cairn site.

Table 33: Vessel data from the Rumsey Cairn site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative
1	VCR	Interior expanding	N/A		
2	Dimpled	Expanding (both)	Flaring	Round	Paddle-edge

At the time that these vessels were analyzed, it was not the intent to include the Hunter Valley Edge-Paddled type in the comparative assessment, and therefore, a profile drawing of Vessel 2 was not completed. Only later was it decided to compare these data with the rest of the site assemblages analyzed.

Saamis - EaOq-7

The Saamis site is a campsite located on a terrace overlooking Seven Persons Creek to the east less than 6 km west of its confluence with the South Saskatchewan River. Milne Brumley (1978) first tested the site in 1971 and excavated it in 1973. A total of five areas (A-E) were identified and all were classified as Protohistoric Old Women's Phase occupation levels based on the co-occurrence of side-notched projectile points, metal and glass trade goods, and Saskatchewan Basin Complex: Late Variant and Cluny pottery. Faunal material yielded radiocarbon dates of 80±70 BP, 210±80 BP, and 335±125BP, which overlap to approximately 200 to 300 BP, although dates this late are subject to significant errors (Milne Brumley 1978:35; Peck 2011: 427).

A total of 461 ceramic sherds were recovered from all five areas of the site, forming at least 19 vessels. Milne Brumley (1978:109) classified 97.2% of the ceramic assemblage as Saskatchewan Basin Complex: Late Variant and 2.2% as Cluny Complex. Surface finishes include check-stamped, cord-marked, fabric/net-impressed, smoothed, and miscellaneous. An additional surface finish was included in the assessment called "Fingertip Impressed Class" (Milne Brumley 1978:120). This surface finish does not link

with any of Byrne's (1973) classifications. These body sherds have no other diagnostic characteristics other than the smooth, overlapping fingertip impressions on the surface. Decorative elements include finger pinches, punctates, and impressions from linear tools, fingernails, cord-wrapped tools, and dentates. The ceramics with the check-stamped surface finish and dentate impressions were classed as Cluny Complex pottery.

Although the ceramic material from this site could not be located at any of the major Alberta artifact repositories, photographs provided by Milne Brumley (1978:195-198) along with the detailed ceramic descriptions (1978:109-126) provided the data for the current study (Table 34, Figure 45).

Table 34: Vessel data from the Saamis site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Element by Portion
1	VCR	Int. flanged	N/A	N/A	R: Pinch; S: Pinch
2	VCR	Ext. beveled	N/A		R: Finger Impr.
3	GCR	Expanding (both)	N/A		
4	GCR	N/A	N/A		
5	VCR	Expanding (both)	N/A		L: CWT
6	VCR	Int. beveled	N/A		R: Fingernail Impr.
7	Roughened	Int. expanding	N/A		
8	Roughened	Expanding (both), Ext. beveled	N/A		
9	Roughened	Expanding (both)	Vertical		R: Pinch
10	Roughened	Expanding (both)	Flaring		
11	Finger Impressed				
12	Smooth	Ext. expanding	N/A	Angled	
13	Smooth	Round	Vertical		
14	Smooth	Ext. expanding	N/A	Angled	R: Angular Impr.; S: Angular Impr.
15	Smooth	Expanding (both), Int. beveled	Flaring		
16	Smooth	Expanding (both)	Vertical		L: CWT
17	Smooth	Expanding (both)	N/A		
18	N/A	Expanding (both)	Flaring		L: Dentate; R: CWT and Dentate; N: Dentate
19	Stamped	Expanding (both), Ext. beveled	N/A	Angled	R: Tiny Punctates and Hole; S: Angular Impr.

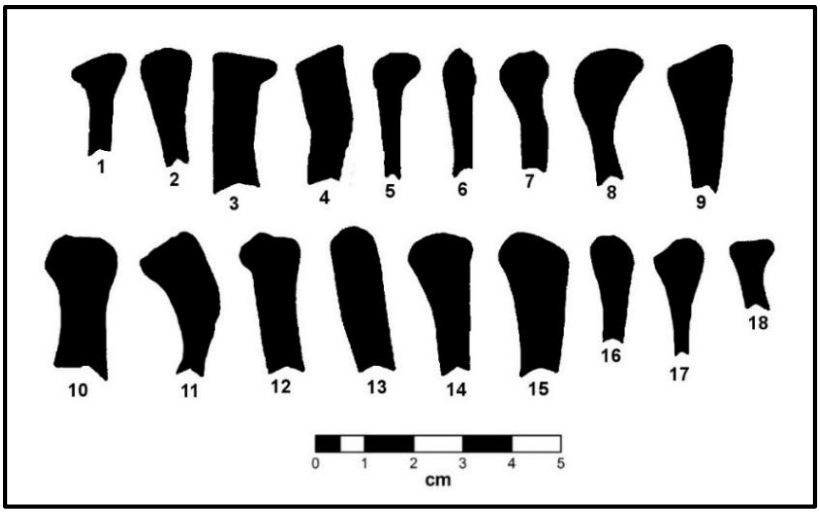


Figure 45: Rim profile drawings from the Saamis site, adapted from Milne Brumley (1978: 181, Figure 19).

This collection evidences that both Old Women's Phase and Cluny pottery was present at the Saamis site. Finger marks on the rim edge are a common feature identified on a number of vessels in this study. The tiny punctates, dentates and check-stamped surfaces are rare.

Sherwin Campbell - EgOa-5

The Sherwin Campbell site is a single occupation processing campsite located in a cultivated field, 8.75 km south of the town of Elrose (Whatley 2004). The site was first identified in 1988 during a power line survey. In 1989, the landowner plowed the land next to the power line and turned up more artifacts. A crew from the University of Saskatchewan conducted a systematic surface collection of the area and recovered projectile points, cores, lithic debitage, heavy stone tools, ochre fragments, endscarpers, and ceramics. Whatley (2004:40) excavated a 1 x 1 m^2 unit in 2001 to recover an *in situ* sample from the site. He interpreted it as a single component site because only one subsurface cultural component was identified. A total of 16 Prairie Side-notched

projectile points were recovered as well as a single Plains Side-notched point. Whatley (2004:181) suggested an approximate date of 650 BP, transitioning between the two point styles. A total of 19 vessels were identified as Old Women's Phase pottery (Whatley 2004:141-142). Due to the dominance of Prairie Side-notched projectile points, this assemblage was placed in the Middle Time Period.

This collection was examined at the University of Saskatchewan (Table 35, Figure 46).

Table 35: Vessel data from the Sherwin Campbell site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Decorative Elements by Portion
1	Roughened	Expanding (both)	N/A		R: CWT
2	VCR	Ext. expanding	Vertical		R: CWT
3	VCR	Round	Vertical	Round	L: CWT
4	VCR	Expanding (both)	Vertical		R: Linear Impr.
5	Textile Impressed	Ext. expanding	N/A		L: CWT
6	Knotted Cord Impressed	Ext. expanding	Vertical		
7	VCR	Ext. expanding	Vertical		
8	Roughened	Expanding (both), Ext. beveled	Flaring		L: Fingernail Impr.
9	VCR	Expanding (both), Ext. beveled	N/A		L: Linear Impr.
10	Roughened	Ext. expanding, Ext. beveled	N/A		
11	Roughened	Expanding (both)	N/A		
12	Roughened	Int. expanding	N/A		
13	GCR	Int. expanding	N/A		
14	VCR	Ext. beveled	N/A		
15	Roughened	Expanding (both)	N/A		
16	VCR	Squared	Vertical		
17	Smooth	Ext. beveled	N/A		
18	GCR	Ext. beveled	N/A		
19	VCR	Expanding (both), Ext. beveled	N/A		
20	Smooth	Subround	N/A		

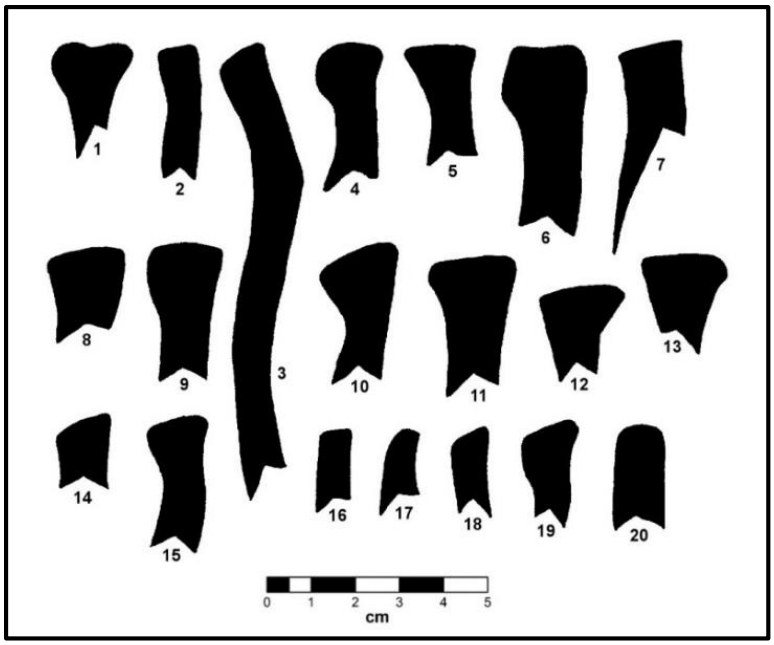


Figure 46: Vessel profile drawings from the Sherwin Campbell site.

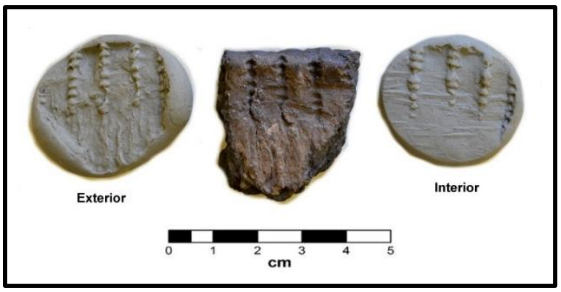


Figure 47: Photo of Vessel 2 showing impressions of exterior and interior and surfaces.

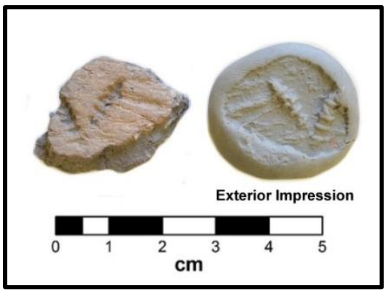


Figure 48: Photo of a neck sherd, not assigned to a vessel number, showing the impression of the exterior surface.

Cord-impressed, fabric-impressed, and plain surfaces were identified. Both neck and shoulder sherds were found in the assemblage indicating complex profiles but these could not be confidently linked with a vessel rim. Three possible round basal sherds were also identified. Decorative elements include CWT impressions, linear impressions, and incised lines. Vessel 2 has vertical CWT impressions on the upper rim edge on both its interior and exterior surfaces (Figure 47). This feature was also noted of sherds from the Gull Lake, Little Bow, Miry Creek, and Twitchell sites. One neck sherd has CWT

impressions marked in a V pattern which could also be part of Vessel 2 but could not refit (Figure 48). The CWT impressions on all the vessels are very thin. Vessel 3 is the most complete vessel. It has a short curved neck and rim with a rounded shoulder. Several lip profiles are unusually thin and do not fit well into the typical Old Women's Phase ceramic assemblage definitions.

Tipperary Creek - FbNp-1

Tipperary Creek is a multi-component campsite located on a stabilized point bar near the mouth of Tipperary Creek, within the Wanuskewin Heritage Park. Members of the Saskatchewan Archaeological Society have been visiting the area since 1930 and archaeological sites have been subjected to various shovel tests and surveys throughout the decades (Walker et al. 1987:2). Walker (1983) officially recorded the Tipperary Creek site during an assessment in 1982 and 1983. This was one of 21 archaeological sites identified during his survey (Walker et al. 1987:3). The Tipperary Creek site was subsequently excavated in 1985-87 and Harty (2005) published the results.

Harty (2005) described stratigraphically separate cultural material including Beseat, Avonlea, Old Women's Phase, and Mortlach. Levels 6-10 were assigned to the Old Women's Phase, representing at least four separate occupation phases (Harty 2005:65, 89). Radiocarbon dates from these levels ranged from 510±70 BP to 1155±75 BP. At least two separate Old Women's Phase vessels were identified from this excavation in associated with Prairie Side-notched projectile points. Unfortunately, these vessels were unavailable to examine.

The vessel referred to as Cronk's Pot in the University of Saskatchewan collection was examined (Figure 49). Green (1993) suggested a link between the vessel

that was recovered by Ken Cronk in 1955 and the 1985-1987 excavation levels. Using Cronk's diary notes, Green (1993:15) connected Cronk's 60 cm deep cultural level to Walker's radiocarbon dates from Levels 7 and 8: 855±70 BP and 800±70 BP respectively. Harty (2005:82) later agreed that the Cronk Pot likely shared similar contexts with these Old Women's Phase levels since shoulder and base sherds found during the excavations were comparable with the Cronk Pot. This vessel has a wide, globular body that tapers slightly to a flat base. The surface finish is vertical cord-roughened, with impressions overlapping on the bottom half. There is a ridged shoulder and constricted neck which curves out into a flared rim. Oblique CWT impressions are displayed on the lip surface.

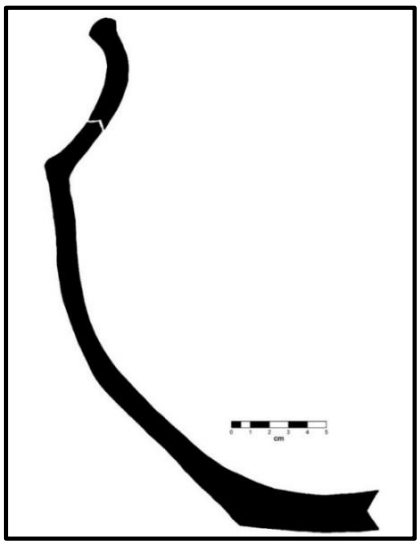


Figure 49: Vessel profile drawing from the Tipperary Creek site.

Trout Creek - DlPk-3

The Trout Creek site is a campsite located on the north bank of Trout Creek, on a south facing terrace, opposite from the Morkin site. Very little information has been recorded about the site. Byrne (1973:103) identified two prehistoric components below the plow zone. The earliest cultural component consists of material associated with both

the Besant and Avonlea time periods, including fabric-impressed ceramic body sherds. Above these layers, side-notched arrow points were found associated with Saskatchewan Basin Complex: Late Variant sherds (Byrne 1973:302, 653). The radiocarbon dates were interpreted as unreliable (Byrne 1973:633).

Of the seven rims identified by Byrne, four were relocated at the University of Calgary (Table 36, Figure 50). The rims are mostly vertical in form. Although body sherds were not assigned to a specific vessel, surface finishes include vertical cord-roughened, dimpled, and smoothed. Angled shoulder and neck sherds are also present in the collection.

Table 36: Vessel data from the Trout Creek site.

Vessel	Surface Finish	Lip	Rim	Decorative Elements by Portion
1	VCR	Expanding (both)	Vertical	
2	VCR	Ext. flanged	Vertical	
3	VCR	Expanding (both)	Vertical	L: CWT
4	N/A	Expanding (both)	N/A	L: CWT

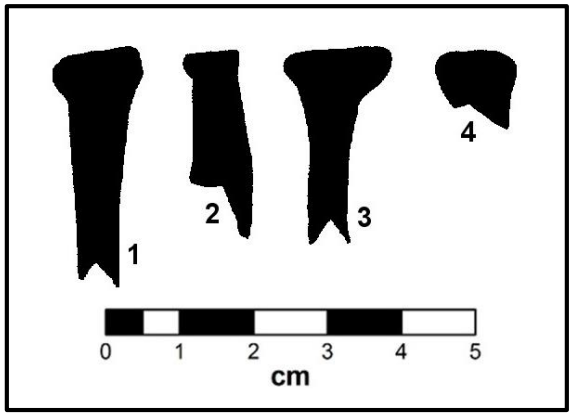


Figure 50: Rim profile drawings from the Trout Creek site.

The flanged lip of Vessel 2 is similar to those found at the Little Bow site, which is located approximately 50 km northwest of the Trout Creek site along the Little Bow River. The thin T-shaped lip form with CWT impressions is similar to Vessel 3 at the Gull Lake site.

Tschetter - FbNr-1

The Tschetter site is a single occupation Bison pound site located in the Dunfermiline Sand Hills of the Aspen Parkland, approximately 10 km northwest of Saskatoon (Prentice 1983). The site was first tested in 1971 to determine if archaeological deposits remained intact after road construction (Dyck 1972). University of Saskatchewan field schools were conducted from 1971-76 (Linnamae 1988; Prentice (1983). After 174 m^2 were excavated, Prentice (1983:26) estimated that only 2% of the site has been assessed.

The single cultural level at the site may represent a series of bison drives that lacked stratigraphical separation. Sterile sand deposits are above and below the cultural zone (Prentice 1983:26). There is a dense bone bed throughout the site consisting of a minimum of 96 bison. The presence of juvenile (7 months old) and adult bison led Walker (1978:5-8) to suggest that the site was occupied sometime between early November to late January. Features found at the site included the bone bed, postholes from the pound structure, charcoal concentrations that contain FBR, burnt bone, pottery, ash, and some lithic debitage (Prentice 1983:44-54). Artifacts from the site consist of 270 Prairie Side-notched projectile points, various other stone tools, bone tools, and ceramic artifacts. The faunal material returned several radiocarbon dates which average at approximately 950 BP.

Four ceramic vessels have been identified at the site (Prentice 1983:128-134). One is based on a single rim sherd which has an exfoliated exterior surface and could likely be from one of the other vessels. The reconstructed vessel has a conical shape with no shoulder and only a slightly flaring rim. The surface finish has dimpled fabric-impressions that have been partially smoothed. The lip surface displays oblique cord

impressions that create a scalloped texture (Prentice 1983:128). Two other vessels have a general roughened surface finish, one with oblique linear impressions on the outer lip corner.

Prentice (1983) assigned the pottery from this site to Saskatchewan Basin Complex: Early Variant based on the simple profile and fabric-impressed surface of Vessel 1; typical of Avonlea components. This form of vessel is not normally found with Prairie Side-notched projectile points. Avonlea and Old Women's Phase transition sites are thought to occur in southern Alberta and northern Montana with Avonlea points associated with complex vessel profiles, particularly at the Upper Kill and Corey Ranch sites (Walde and Meyer 2003:142). The Tschetter site may be another representation of this transitional stage.

The four vessels described by Prentice (1983) were examined at the University of Saskatchewan (Table 37, Figure 51). In addition to the complete simple profile of Vessel 1, other interesting attributes were noted. Vessel 4 has very thin CWT impressions on the upper rim edge in a zig-zag pattern. Below this are at least 3 rows of horizontal CWT impressions. These features are similar to Vessel 2 from the Sherwin Campbell site and the horizontal impressions are comparable to Vessel 5 from Gull Lake.

Table 37: Vessel data from the Tschetter site.

Vessel	Surface Finish	Lip	Rim	Shoulder	Base	Decorative Elements by Portion
1	Dimpled	Expanding (both)	Vertical	None	Tapering	L: CWT
2	Smooth	Expanding (both)	N/A			R: Linear Impr.
3	VCR	Expanding (both)	Vertical			
4	Roughened	Expanding (both)	Vertical			R: CWT and CWT

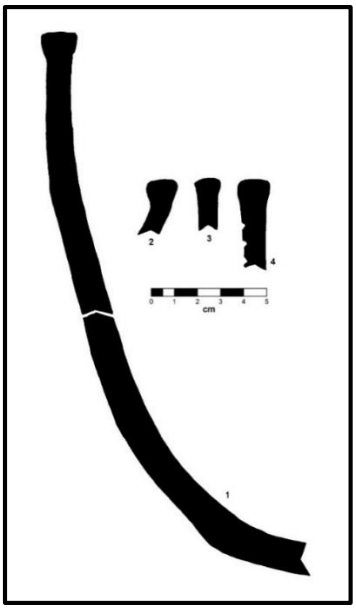


Figure 51: Vessel profile drawings from the Tschetter site.

Twitchell (24MC70)

The Twitchell site is a buffalo jump and processing site located on a bench feature along the Missouri River, approximately 29 km east of Fort Peck, Montana. The site has been substantially looted since the 1930s. Preliminary excavations were conducted in 2005 to investigate the ceramic artifacts which were identified as Saskatchewan Basin Complex as they provided a rare opportunity to explore the extent of the Old Women's Phase in northeastern Montana (Joyes et al. 2007:45-47).

The site was interpreted as having a single subsurface cultural layer, though it was recognized that this could have represented multiple occupations. Several pit and hearth features were identified, along with Prairie Side-notched and possibly Avonlea projectile points, other lithic and bone tools, bison bone, and ceramics. The cultural layer has an average radiocarbon date of approximately 1240 BP.

The two vessels described consist of small rim fragments with vertical CWT impressions of both the interior and exterior of the upper rim edge (Joyes et al. 2007:51,

52, 54). Joyes et al. (2007) recognized this feature as similar to that found at the Gull Lake site. They suggested that this attribute is connected with the transition from Avonlea to Old Women's Phase.

Data from the Twitchell site used in the current analysis came directly from Joyes et al.'s (2007) research.

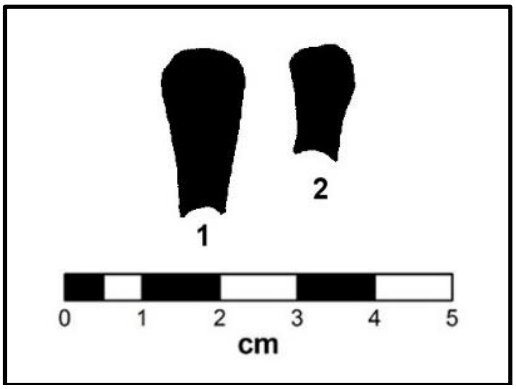


Figure 52: Rim profile drawings from the Twitchell site, adapted from Joyes et al. (2007:54, Figure 10).

Upper Kill - DlPd-1

The Upper Kill site is a bison kill site in the upper coulee draw south of the Oldman River, approximately 1 km west of the confluence with the Little Bow River. This is possible that the Upper Kill site was associated with the Ross campsite though this is only due to proximity and not artifact similarities (Forbis (1960:121). The Lower Kill site is located 200 yards below the Upper kill area. Forbis (1960) excavated the site and recovered a cultural layer six feet of bison bone, Avonlea projectile points, lithic debitage, and three potsherds including neck and shoulder sherds.

Unfortunately, collectors knew about the site for years before formal investigations began. It is likely that a significant number of ceramic artifacts are now in private collections. Walde et al. (1995:22) referred to this site as a transitional occupation

between the Avonlea and Old Women's Phase cultural periods based on the complex profiles with necks and shoulders and the vertical cord-roughened surface finishes of the ceramics found in association with Avonlea projectile points.

Only one angled shoulder sherd could be found in the collections at the University of Calgary. It has a vertical cord-impressed surface and left oblique liner impressions on the shoulder ridge (Figure 53).

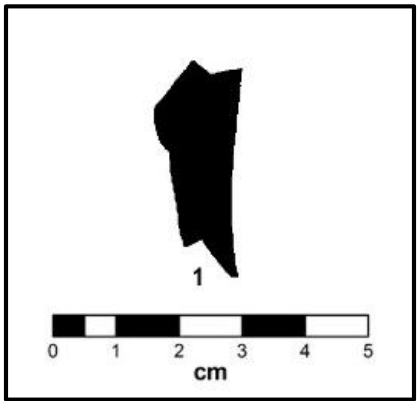


Figure 53: Shoulder profile drawing from the Upper Kill site.

Walter Felt - EcNm-8

The Walter Felt site is a multi-component bison pound site located on a wooded terrace south of the Missouri Coteau near the Mortlach site (Kehoe 1973:164). Kehoe conducted excavations there in 1962 and 1965, but a detailed site report was never completed. Kehoe and Kehoe (1968:31-33) and Kehoe (1973:164) provided brief notes about the site. A total of 12 layers containing artifacts were identified, usually separated by sterile zones. The earliest occupation layer had a date of 2430±90 BP, followed by a Besant layer (1610±70 BP), and an Avonlea and Besant transitional layer (1535±80 BP). Prairie Side-notched projectile points were found in Layers 6 and 7 (700±80 BP and 1260±70 BP respectively). Plains Side-notched projectile points were found in Layers 1-4

and Layer 4 yielded a date of 400±40 BP. Layer 3 was the densest cultural layer associated with the bison pound.

Malainey (1991) and Walde (2003) analyzed the ceramics in detail and assigned the assemblage to either Mortlach or Wascana ware. Malainey (1991:180-181) identified 145 vessels from this site. She noted that the sherds from Layers 5-7 look very similar to those from the upper layers, and grouped them all together. She further commented that while most of the sherds have provenience information, a few rims lacked catalogue numbers (Malainey 1991:180). Differing temper descriptions were also noted. While most temper is crushed granite, the temper in one vessel is noticeably coarser-grained, and some of the vessels have fine-grained sand temper (Malainey 1991:386). Walde (2003:106) followed her methodology, although he only reported on 140 vessels from the site.

This site is included in the present study because some of the vessels fit the descriptions of Ethridge ware, Saskatchewan Basin Complex: Late Variant, and Old Women's Phase pottery. They have thick walls, vertical cord-roughened surface finishes, and ridged shoulders. Furthermore, Meyer (1988:59) listed the Walter Felt site as having Old Women's Phase components, and Kehoe and Kehoe (1968:31) noted that much of the pottery recovered was associated with the Prairie Side-notched point styles. It is possible that the pottery found at the site is a mixture of both Mortlach and Old Women's Phase pottery.

One reconstructed vessel was recovered from a back storage office at the Royal Saskatchewan Museum that does not appear to have been part of the assessment by Malainey (1991) or Walde (2003). It has a vertical rim, curved neck, angled shoulder, and a round base. The surface finish is vertically cord-roughened and has been partially

smoothed. No decorative elements are present. The one catalogue number on a sherd (#4464) corresponds to Layer 7 in the catalogue. Though it is possible that this vessel might be related to the upper components, it offered an opportunity to compare its attributes with other Old Women's Phase pottery styles in detail. Based on the presence of Prairie Side-notched projectile points found in Layers 6 and 7, this vessel was assigned to the Middle Time Period.

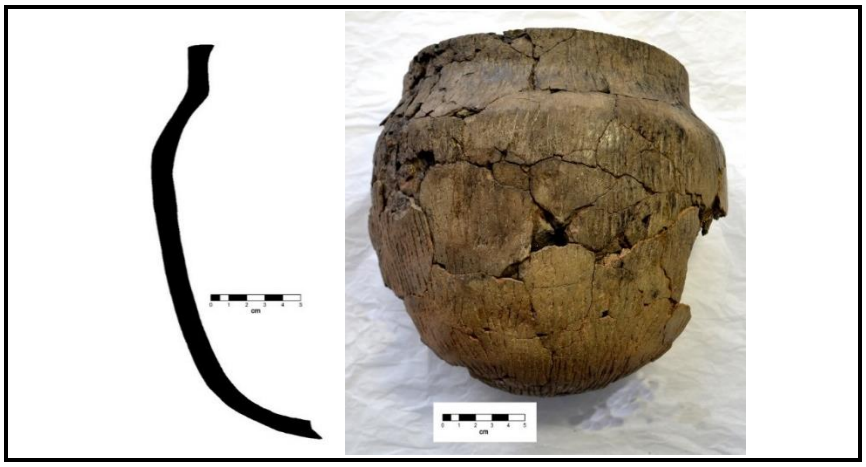


Figure 54: Vessel profile drawing (left) and a photo of the vessel from the Walter Felt site.

Summary

Ceramic artifacts collected from 47 sites were included in this study (Table 38). Artifact from 27 of the sites were physically examined and additional data were added from published literature for another 20 sites. Several vessels were confined to displays and were assessed by visual interpretation only.

Table 38: Summary of site data used in this study.

Site Name	Number of Vessels	Approx. Date	Time Period	Data Collection
Antelope Creek – EeOc-2	26			LT
Blakiston – DjPm-115	7	730	Middle	P / D
Bodo Bison Skulls – FaOm-1	15	150*	Late	P
Bodo Overlook – FaOm-22	5			P
Bridgewater – EfPl-34	2			P
British Block – EdOp-1	2			P
Cache – 24HL49	2			LT
Castleforks Buffalo Jump – DjPm-126	5	460	Middle	P
Corey Ranch – 24TT83	1	970	Early	LT
DgPa-3	4			LT
DgPa-4	2			LT
Dundurn	2			P
EbPi-51	2			LT
EbPi-52	1			LT
EbPi-57	3			LT
EbPi-63	2			LT
EbPi-67	3			LT
EbPi-73	11			LT
EfOw-26	2	260	Late	P
EgPm-82	1	930	Early	LT
EkPf-38	1	830	Early	LT
Ethridge	2			LT
FM Ranch Campsite – EfPk-1	3	700	Middle	P
Fresno – 24HL103	6	250	Late	LT
Garratt Site – EcNj-7	12			P
Grassy Lake Cairn – DlOv-1	3			P
Gull Lake – EaOd-1	11	250-1220	Early-Late	P / D
Head-Smashed-In – DkPj-1	5			P
Hunter Valley – EiPp-16	4	415	Middle	P
Junction Site – DkPi-2	23	500-800	Early-Late	P
Kenny – DkPk-1	1	355	Late	P
Little Bow – EaPh-4	12	500	Middle	P / LT
Miry Creek – EeOc-5	30			LT
Morkin – DlPk-2	15			P / LT
Old Women's Buffalo Jump – EcPl-1	1			P
Piche Pot – DkNv-15	1			LT
Pouliot – 24GL1002	1			LT
Ross – DlPd-3	17	580	Middle	P
Rumsey Cairn – EkPf-1	2			P / LT
Saamis – EaOq-7	19	250	Late	LT
Sherwin Campbell – EgOa-5	20	650	Early	P
Tipperary Creek – FbNp-1	1	800	Early	P
Trout Creek Campsite – DlPk-3	4			P
Tschetter – FbNr-1	4	950	Early	P
Twitchell – 24MC70	2	1195	Early	LT
Upper Kill – DlPd-1	1			P
Walter Felt – EcNm-8	1	700	Middle	P

P=Physically examined artifacts, LT=Literature source, D=Artifact in display

* Only Vessel 15 from the Bodo Bison Skulls site is associated with temporal data.

A total of 292 lips, 292 rims, 150 necks, 64 shoulders, 51 bodies, and 14 bases were recorded. Identifying the orientation of each particular portion was more challenging and only 280 lips, 154 rims, and 58 shoulder profiles could be determined. Decorative elements were found on 148 of the 300 vessels. Approximate dates were assigned to 140 vessels.

CHAPTER 4: Vessel Attribute Analysis

A total of 300 vessels were used in this study that had been previously identified as either Ethridge ware, Saskatchewan Basin Complex: Late Variant, or Old Women's Phase pottery. An additional 160 sherds were recorded but they could not be confidently assigned to a particular vessel. These sherds were not included in the comparative analysis, but notable artifacts were discussed where applicable.

This chapter provides a comparative analysis of the vessels, focusing on the frequencies of surface finish, vessel form, and decorative elements. Surface finish and rim profiles were compared with all other attributes. Decorative elements were assessed based on where they were located on the vessel. Temporal and spatial distributions of attribute frequencies were explored. Additional data regarding the quality of surface finishes, temper, hardness, and residue characteristics, along with detailed measurements of cord impressions, thicknesses, heights, and decorative elements can be found in Appendix A.

Surface Finish and Temper

Surface finish could be identified on 267 of the 300 vessels. The remaining 33 vessels were either too small to detect a pattern or the images published in the literature were unclear. The most common type of surface finish was vertical cord-roughened, found on 121 vessels (45.3%) (Figure 55). The 21 vessels (7.9%) with general cord-impressed surface finishes may have vertically oriented impressions, but the irregularity and nonparallel direction warranted recognition. The knotted cord-impressed finish also represents a type of vertical impression, but with clear patterns of dimpled impressions along the cord impressions. This finish is only seen on three vessels (1.1%), one from

each of the Morkin, Ross, and Sherwin Campbell sites. If this surface treatment was partially smoothed, it may look very similar to the more general dimpled finish, though the orientation of the cords might still be evident. The weft and weave can be clearly identified in the textile impressed surface of nine vessels (3.4%). If this finish had been partially smoothed, it is likely that the resulting finish would be appear dimpled. The 'general roughened' category was assigned to 48 vessels (18%) and could have originally represented any of the textured categories but partial smoothing has left no identifiable pattern. At total of 50 vessels (18.7%) were smoothed and displayed no texture. The stamped, brushed, and finger impressed categories are the rarest surface treatments.

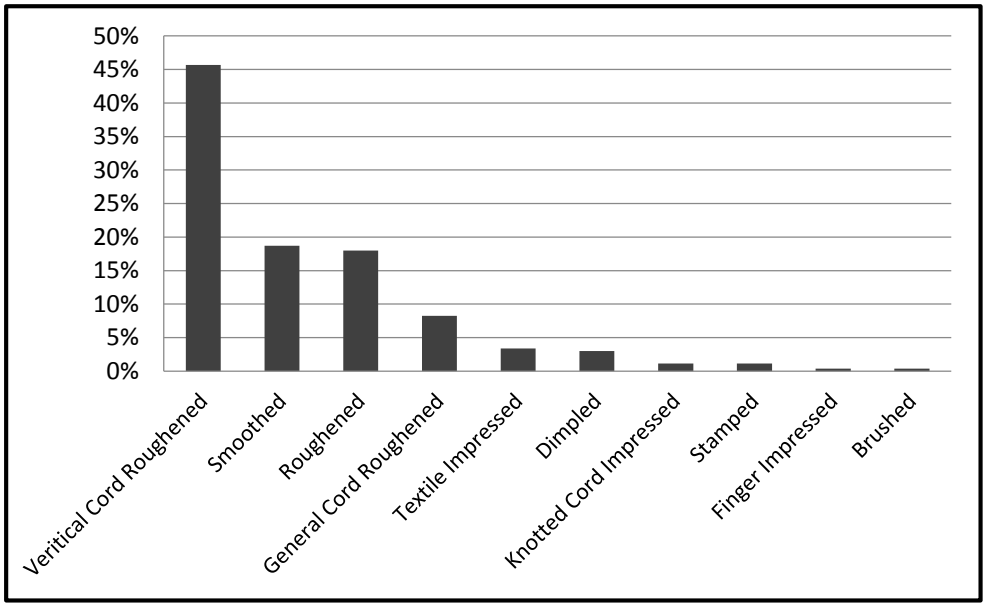


Figure 55: Percentage frequencies of vessels with identifiable surface finishes.

Approximate temporal time periods were associated with 128 vessels that had an identifiable surface finish (Table 39). The most common surfaces including cord-roughened, roughened, and smoothed occur relatively consistently throughout all time periods. A very loose trend shows the stamped and finger-impressed surfaces only showed up in the last half of the distribution and the dimpled surfaces are earlier.

Table 39: Number of vessels by surface finish and time period.

Surface Finish	Time Period			TOTAL
	Early	Middle	Late	
Vertical Cord Roughened	13	26	14	53
Roughened	13	5	6	24
Smoothed	6	11	7	24
General Cord Roughened	4	6	4	14
Dimpled	2	3		5
Stamped		1	2	3
Knotted Cord Impressed	1	1		2
Textile Impressed	1		1	2
Finger Impressed			1	1
TOTAL	**40**	**53**	**35**	**128**

The surface finish on the majority of all of the vessels have been partially or completely obliterated (67.4%). Only 32 vessels (10.7% of all vessels) identified had textures in the clay that were left as originally impressed. Most textures left very light to moderate impressions, but Vessel 10 from Little Bow had deep, parallel, and widely spaced vertical cord impressions. The degree of surface treatment could not be identified in the remaining 65 vessels (21.7 %).

The space between surface impressions was recorded on 110 vessels and ranged from 0.7 – 5.0 mm. The average space was 2.0 mm with a standard deviation of 0.88. Vessels that have spaces greater than 4 mm include Little Bow: Vessel 10, Miry Creek: Vessel 26, Pouliot: Vessel 1, Ross: Vessel 1, and Sherwin Campbell: Vessel 6. The average width of the cordage was 1.7 mm with a standard deviation of 0.65. Vessels that have cord impressions wider than 3 mm include Vessel 3 and 4 from Blakiston, the one vessel from EkPf-38, Vessels 1 and 3 from the Tschetter site, Vessel 12 from Gull Lake, Vessel 3 from Hunter Valley, Vessel 6 from Sherwin Campbell. There are no cords thinner than two standard deviations away from the average. Measurements of the space between and width of the cord impressions are provided in in Appendix A (Table 82).

The cordage was further analyzed to determine the twist of the cord during manufacture. As this information is recorded by secondary context through the impressions left of the clay, it can be very difficult to determine. Of the 147 vessels that have vertical, knotted, or general cord impressions, the twist direction was only able to be determined on 31. Nine vessels (29%) had an S-twisted cord and 22 had a Z-twist (71%).

Primary temper material was material identified in 214 of the vessels and was compared with surface finish (Table 40). Granite is the most dominant temper material (80.4%). Feldspar (9.3%) and quartz (5.1%) are next most frequent materials, not surprising due to their occurrence within granite. It is possible that these vessels were tempered with a type of granite that was more feldspar and quartz dominant. This could also be the case for the single vessel (Little Bow: Vessel 8) with the dominance of mica for temper. The granite, feldspar, and quartzite tempers were all very angular, thus it is unlikely that they were from the primary clay source. The 10 vessels that are tempered with sand (4.7%) are more unique. The only vessels that were included in this study that have sand temper are from Antelope Creek and Miry Creek Vessel.

Table 40: Primary temper material by surface finish.

Exterior Surface Finish	Primary Temper					TOTAL
	Granite	Feldspar	Quartzite	Sand	Mica	
Vertical Cord Roughened	67	9	3	4		83
Smooth	29	5	3	1		38
Roughened	29	4		1		34
General Cord Roughened	15		3	1		19
Undeterminable	13	1	1	3	1	19
Textile Impressed	6	1				7
Dimpled	6					6
Knotted Cord Impressed	3					3
Stamped	2		1			3
Brushed	1					1
Finger Impressed	1					1
TOTAL	**172**	**20**	**11**	**10**	**1**	**214**

Overall, the most frequent temper material corresponded to the most frequent surface finish. Even the sand tempered vessels had a cord roughened or smoothed surface finish. The less frequent surface finishes, such as stamped, brushed, and finger impressed are also tempered with the common granite temper.

Environmental firing conditions, paste quality, temper size and density, and hardness were recorded which may have the potential to aid in questions regarding in the manufacturing and functional aspects of Northwestern Plains ceramics in the future. These attributes were assessed but the variation within the site and within the vessel has resulted in insignificant findings related to typology. These data are available for future analysis on technological attributes.

Profiles

Lip Profiles

A total of 294 lip portions from the 300 vessels were identified. Of these, 281 lip profiles could be determined. The missing data from the 13 remaining lip portions were because the sherd was too small to determine the orientation or the literature sources did not provide a profile image. Flattened lips were observed on 74.3% of the vessels, while 25.7% are round. The 281 lip profiles were classified into 16 distinct types (Figure 56).

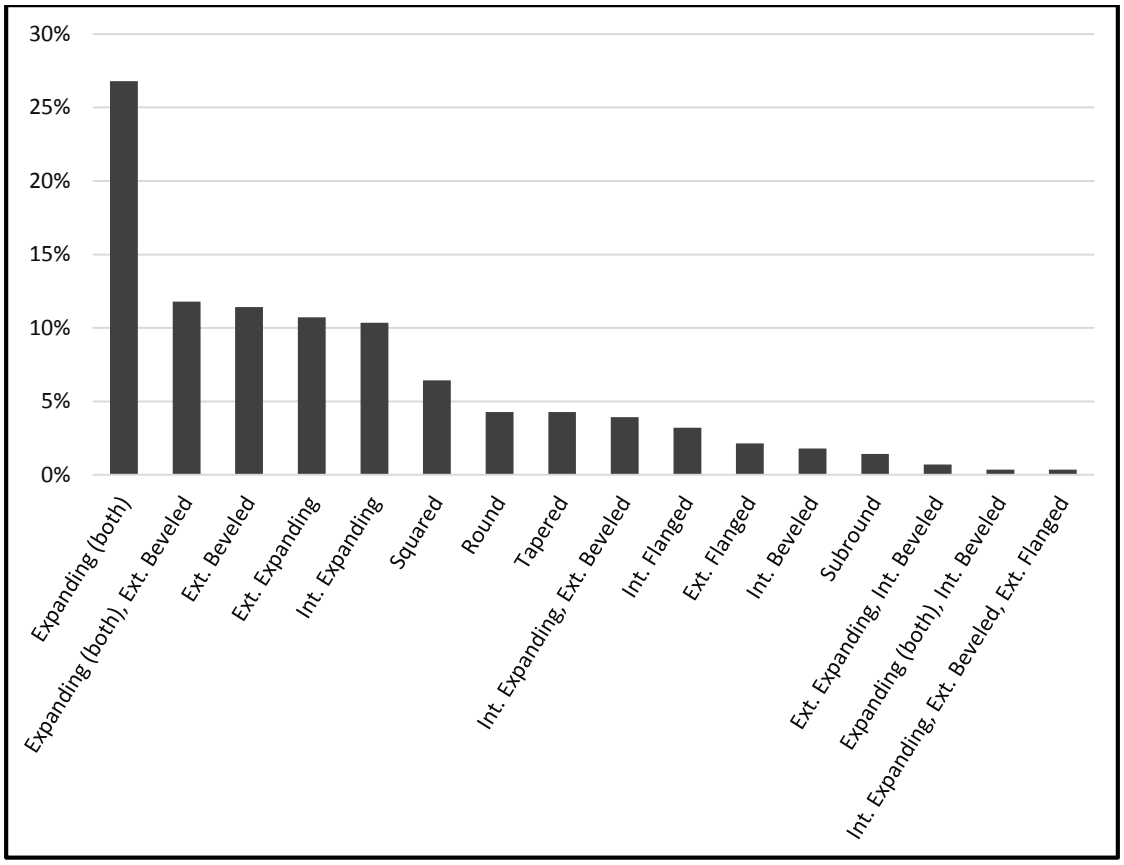


Figure 56: Percentage frequencies of identified lip profiles.

The variation in lip forms was very large. This was observed in both the size and the profile. The variability may be the result of the individual manufacturing techniques. The lip is often the last portion to be formed and inconsistencies within a single vessel can vary. This was observed when multiple lip profiles were identified on the same vessel from the Bodo Overlook, Bridgewater, Castleforks Buffalo Jump, FM Ranch Campsite, Garratt, and Ross sites. The most consistent form identified on the vessel was used in this analysis.

Although the lip profiles are highly variable, the most frequent lip forms were expanding both to the interior and the exterior, found on 75 vessels (26.7%). When all of the categories that had some degree of expanding were combined, 183 of the 281 lips (65.1%) were grouped into this category. However, since there is evidence of additional

modification to the lip form, these differences were recognized. A total of 78 lips (27.8%) are beveled down to the exterior and only eight (2.8%) had a bevel down to the interior. This characteristic was seen on vessels from Antelope Creek, EbPi-6, EbPi-73, Hunter Valley, Miry Creek, and Saamis. These specific lip profiles might suggest intentional forms, but given that there are not many of these vessels present, inconsistent finishing techniques should be considered.

Approximate dates were associated with 134 vessels with an identifiable lip profile (Table 41). Expanding profiles were found in all time periods. Though the frequency is low, flanged and interior beveled profiles only occurred in the later periods. The one interior beveled lip dated to the middle period is from the Hunter Valley site with an approximate date of 415 BP.

Table 41: Lip profile counts by time period.

Lip Profile	Time Period			TOTAL
	Early	Middle	Late	
Expanding (both)	11	9	18	38
Expanding (both), Ext. Beveled	4	11	4	19
Ex. Expanding	5	10	2	17
Ext. Beveled	6	6	2	14
Int. Expanding	4	5	2	11
Round	6	1	1	8
Int. Expanding, Ext. Beveled	2	3	1	6
Squared	2	2	1	5
Ext. Flanged		4		4
Int. Flanged		2	2	4
Int. Beveled		1	1	2
Subround	2			2
Ext. Expanding, Ext. Beveled	1			1
Expanding (both), Int. Beveled			1	1
Int. Expanding, Ext. Beveled, Ext. Flanged			1	1
Tapered	1			1
TOTAL	**44**	**54**	**36**	**134**

Of the 281 lip profiles, 252 had enough of the vessel present to determine surface finish (Table 42). Generally, the most common surface finish occurs with nearly all of the

lip profiles and the most common lip profiles show up with all of the surface finishes. Some combinations stood out. For instance, 10 out of 47 vessels with a smoothed surface finish have an exterior expanding lip form. These were recorded on vessels from EbPi-63, FM Ranch Campsite, Head-Smashed-In Buffalo Jump, Junction, Miry Creek, Morkin, Ross, and Saamis. Most of these sites cluster in south-central Alberta, with the exception of Saamis and Miry Creek, and have dates within the middle and late time periods. A total of 57% of smoothed finished vessels have some form of expanding lip. The three vessels from Morkin and Head-Smashed-In Buffalo Jump with brushed surface finishes also stand out since they were found with the less common and rare lip profiles.

Table 42: Lip profiles with exterior surface finish.

Lip Profile	Surface Finish									TOTAL
	Vertical Cord Roughened	Roughened	Smoothed	General Cord Roughened	Textile Impressed	Dimpled	Knotted Cord Impressed	Stamped	Brushed	
Expanding (both)	28	13	7	5	6	4		1		64
Expanding (both), Ext. Beveled	15	5	4	3	1	1	1	1		31
Ext. Expanding	11	2	10	1	1	2	2			29
Ext. Beveled	17	5	3	3						28
Int. Expanding	11	7	5	2	1			1	1	28
Squared	10	3	3	1						17
Round	3	2	6							11
Tapered	2	3	5							10
Int. Expanding, Ext. Beveled	6	1		1						8
Ext. Flanged	5		1							6
Int. Flanged	3	2							1	6
Int. Beveled	2	1		2						5
Subround		2	2							4
Ext. Expanding, Int. Beveled	1								1	2
Int. Expanding, Ext. Beveled, Ext. Flanged	1									1
Expanding (both), Int. Beveled			1							1
Ext. Expanding, Ext. Beveled		1								1
TOTAL	**115**	**47**	**47**	**18**	**9**	**7**	**3**	**3**	**3**	**252**

The lip width is often the thickest portion of the vessel, particularly since many of them are expanding in form. The minimum and maximum width was measured on 285 lip portions. Lip thickness in a single vessel ranged from 0.1-11.0 mm, with an average of 1.5 mm. The variability was likely caused by uneven pressure during the final shaping stage. The lip width ranged from 3.3-21.2 mm and averaged of 11.2 mm with a standard deviation of 2.97 mm.

Rim Profiles

Rim profiles could be confidently oriented on 155 vessels from 38 sites out of the 293 vessels rim portions recorded. The remaining 138 rim portions were too small to determine an orientation. Vertically oriented rim profiles were the most frequent form and were found on 109 vessels (70.3%) (Figure 57). Flaring profiles are the next most common but were only recorded on 34 vessels (21.9%). The rare occurrence of constricted, angled, and collared rims is significant in comparison. Constricted vessels were identified at Morkin, Miry Creek, Ross, and Fresno and angled rim forms were identified at Garratt and Miry Creek. The two collared vessels found at the Blakiston site are quite rare for this region.

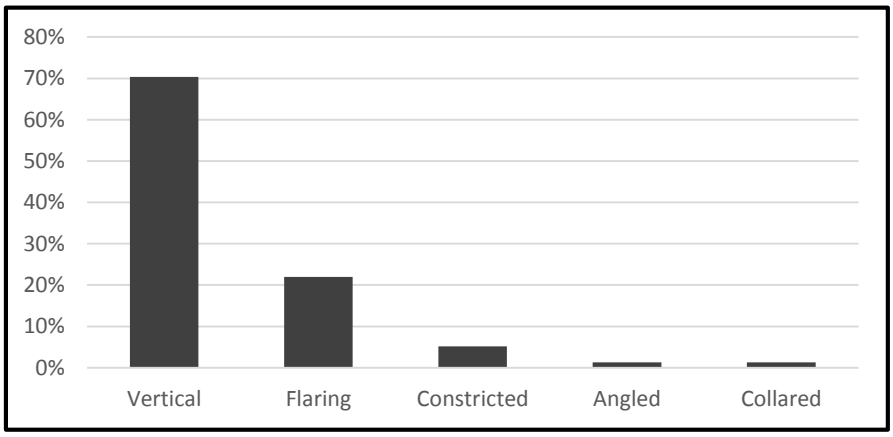


Figure 57: Percentage frequencies of identified rim profiles.

There does not appear to be any spatial patterns in the distribution of the vertical, flaring, or constricted rim profiles. Temporal distributions are similarly insignificant (Table 43).

Table 43: Rim profiles by time period.

Rim Profile	Time Period			TOTAL
	Early	Middle	Late	
Vertical	19	28	9	56
Flaring	6	7	7	20
Constricted		1	3	4
Collared		2		2
TOTAL	**25**	**38**	**19**	**82**

The combination of rim profiles and surface finish was determined on 149 vessels (Table 44). Vertical and flaring rims were found with nearly all surface finishes and are the only rim profiles found with the less frequent stamped, brushed, and textile impressed surface finishes. The less common constricted, angled, and collared rim profiles were only found on roughened and smoothed surfaced vessels.

Table 44: Rim profiles by surface finish.

Surface Finish	Rim Profile					TOTAL
	Vertical	Flaring	Constricted	Angled	Collared	
Vertical Cord Roughened	53	12	3	2	2	72
Roughened	21	6				27
Smoothed	14	6	4			24
General Cord Roughened	6	2	1			9
Dimpled	4	3				7
Brushed	3					3
Knotted Cord Impressed	2	1				3
Textile Impressed	2					2
Stamped	1	1				2
TOTAL	**106**	**31**	**8**	**2**	**2**	**149**

Approximate rim diameter sizes were able to be determined for 73 vessels. Of these, only 66 also had a determinable rim profile (Table 45). The most common diameter ranged from 16-25 cm. Larger or smaller openings only occur with vertical or

flaring rims, however, the distribution of the constricted, angled, or collared profiles may only be lacking in these sizes due to sample quality rather than the actual representation.

Table 45: Approximate size of rim diameter by rim profile.

Rim Diameter (cm)	Rim Profile					TOTAL
	Vertical	Flaring	Constricted	Angled	Collared	
11-15	5	1				6
16-20	15	10	1			26
21-25	15	5	4	1	1	26
26-30	4	2				6
31-35	1	1				2
TOTAL	**40**	**19**	**5**	**1**	**1**	**66**

Vessels with smaller rim diameters (11-15 cm) were found at Antelope Creek, Bodo Bison Skulls, Fresno, Grassy Lake Cairn, Miry Creek, and Saamis. Site collections that had vessels larger than 25 cm in diameter include Blakiston, Bodo Bison Skulls, DgPa-4, Garratt, Gull Lake, Junction, Pouliot, and Ross.

The temporal distribution showed that the four smallest vessels (11-15 cm) were from the Saamis and Fresno sites which date to the late period (after 300 BP) (Table 46). Vessels with 16-25 cm diameters date to all time periods, but the larger vessels (26-35 cm) seem to have been produced after 700 BP.

Table 46: Rim diameter by time period.

Rim Diameter (cm)	Time Period			TOTAL
	Early	Middle	Late	
11-15			4	4
16-20	8	12	5	25
21-25	4	6	2	12
26-30		2	1	3
31-35		1	1	2
TOTAL	**12**	**21**	**13**	**46**

Rim height was measured and compared with the rim profiles (Table 47). The height represents the length of the straight rim portion and the neck length begins when

the vessel starts to curve. The minimum rim lengths were recorded when only a portion of the rim was present but only complete rim lengths were used in the current analysis. The average rim height was longest in the single angled rim from Miry Creek. The vertical profile is most likely the longest in average rim length but the high variance suggests that that the rim profile is not a determining factor in rim height. Even the range in rim height at individual sites can be quite large. For example, there are 12 vessels from the Junction site that had a complete rim and the lengths ranged from 2.5-36.7 mm, averaging of 19.2 mm with a standard deviation 10.7. The standard deviation for vertical rim profiles is high compared to the other profiles. This is because the length of vertical rims ranged from very short (3.3 mm) to quite tall (45.4 mm). The longer rim lengths were found to correlate with other common attributes and is discussed further in the following chapter.

Table 47: Statistical summaries of the rim lengths by rim profiles.

Rim Profile	Count	Min. Rim Length	Max. Rim Length	Avg. Rim Length	St Dev.
Angled	1	35	35	35.00	
Collared	2	19.7	25	22.35	3.75
Vertical	76	3.3	45.4	19.02	11.29
Flaring	27	2.5	28.5	12.65	7.67
Constricted	5	3	25	12.34	8.28

Neck profile

There was no qualitative classification for neck profiles. Neck length, width, and angle measurements were assessed. The neck length was measured but is most useful when combined with the rim height. This measurement provides the distance from the lip to the shoulder. The spatial and temporal distribution of this attribute did not yield any significant patterns. The ranges, averages, and standard deviation of the rim and neck measurements by site, as well as from the total study, is provided (Table 48).

Table 48: Combined rim height and neck length by site.

Site Name	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Sample
Antelope Creek	50.0	50.0	50.00	1
Blakiston	40.0	40.0	40.00	1
Bodo Bison Skulls	13.0	54.3	28.87	3
Cache	8.0	8.0	8.00	1
Castleforks Buffalo Jump	60.0	60.0	60.00	2
Corey Ranch	34.0	34.0	34.00	1
DgPa-3	38.0	38.0	38.00	1
DgPa-4	16.6	88.0	52.30	2
Dundurn	18.9	44.8	31.85	2
EbPi-73	21.5	26.1	23.80	2
EkPf-38	36.3	36.3	36.30	1
FM Ranch Campsite	35.5	45.0	40.25	2
Garratt Site	69.0	69.0	69.00	1
Head-Smashed-In	56.0	56.0	56.00	1
Hunter Valley	44.6	67.6	56.10	4
Junction Site	50.6	51.2	50.90	2
Morkin	31.9	35.6	33.75	2
Piche Pot	63.0	63.0	63.00	1
Pouliot	27.5	27.5	27.50	1
Ross	28.6	48.6	42.03	4
Sherwin Campbell	36.0	41.5	38.75	2
Tipperary Creek	50.0	50.0	50.00	1
Tschetter	17.0	17.0	17.00	1
Walter Felt	37.0	37.0	37.00	1
TOTAL STUDY	**8.0**	**88.0**	**40.94**	**38**

Neck angles were measured and compared to surface finish (Table 49). Since the angles were measured in degrees, the smaller the number, the more acute the angle is. The dimpled surface finish tends to have the straighter, more obtuse neck angle of all the surface finishes. The cord roughened surfaces generally have sharper neck angles. Only one vessel with stamped and knotted cord impressed surface finishes were noted, thus the variation in these angles cannot be determined, though the sharp angle of these necks is noteworthy compared with the other averages.

Table 49: Neck angle by surface finish.

Surface Finish	Min Angle	Max Angle	Avg Angle	St. Dev.	Sample
Dimpled	145	170	154.25	11.35	4
Roughened	140	150	145.00	5.00	3
General Cord Roughened	110	153	138.25	19.64	4
Vertical Cord Roughened	100	160	133.42	19.09	24
Smoothed	100	165	130.71	28.49	7
Stamped	110	110	110.00		1
Knotted Cord Impressed	100	100	100.00		1

Shoulder Profiles

A total of 58 shoulder profiles where identified from the 64 recorded shoulders. The remaining six shoulders were either broken at the shoulder junction or the published literature did not provide these details. Angled shoulders are the most common form and were found on 31 vessels (53.4%) (Figure 58). Round shoulders were also frequent and identified on 22 vessels (37.9%). The simple forms vessels with no shoulder were recorded on a total of five vessels from the Bodo Bison Skulls, Fresno, Pouliot, and Tschetter sites.

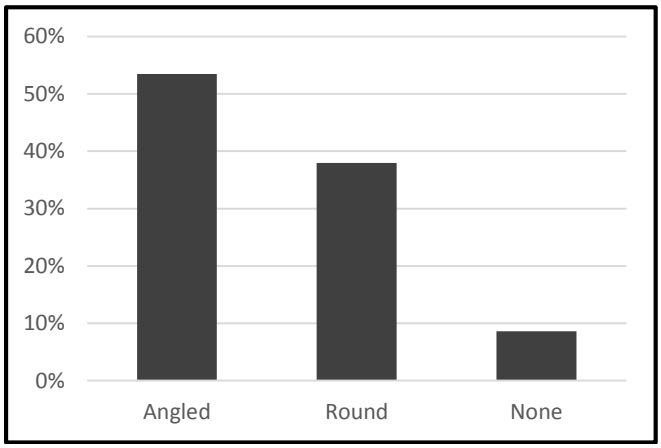


Figure 58: Percentage frequencies of identified shoulder profiles.

There is no spatial clustering of any of the shoulder profiles. A total of 35 vessels have an identified shoulder profile associated with an approximate date (Table 50). While round shoulders tend to date to all time periods, angled profiles become more frequent in

the middle and late periods. Although the lack of shoulder (simple profile) is often associated with Avonlea pottery, Keyser (1980:6-9) described Vessels 3 and 4 from the Fresno site, with an approximate date between 250-400 BP, as having this attribute.

Table 50: Shoulder profiles by time period.

Shoulder Profile	Time Period			TOTAL
	Early	Middle	Late	
Angled	1	11	6	**18**
Round	4	5	5	**14**
None	1		2	**3**
TOTAL	**6**	**16**	**13**	**35**

Surface finish could be determined on 56 vessels with identified shoulder profiles (Table 51). There does not appear to be any correlation between surface finish and shoulder profile. The less frequent surface finishes including stamped, brushed, and knotted cord-impressed occur on both round and angled profiles. Vessels with no shoulders tend to be limited to cord impressed or dimpled surfaces, though this sample is very low.

Table 51: Shoulder profiles with surface finishes.

Surface Finish	Shoulder Profile			TOTAL
	Angled	Round	None	
Vertical Cord Roughened	20	11	3	**34**
Smoothed	5	4		**9**
Dimpled		3	1	**4**
General Cord Roughened	2		1	**3**
Roughened	2			**2**
Stamped	1	1		**2**
Brushed	1			**1**
Knotted Cord Impressed		1		**1**
TOTAL	31	20	5	**56**

Rim and shoulder profiles were identified on 49 vessels (Table 52). Vertical rim profiles are the most common on all of the shoulder profiles and angled and collared rims

only show up with ridged shoulders. Constricted rims were not associated with angled shoulders.

Table 52: Shoulder profiles with rim profiles.

Rim Profile	Shoulder Profile			TOTAL
	Angled	Round	None	
Vertical	14	8	2	**24**
Flaring	7	11	1	**19**
Constricted		2	2	**4**
Angled	1			**1**
Collared	1			**1**
TOTAL	**23**	**21**	**5**	**49**

Metric data were recorded for the shoulder angles and widths. These attributes were compared by site, time periods, rim profiles, shoulder profiles, and rim diameter. None of these comparisons yielded any significant results. The only trend that was notabley obvious, was that the neck angle on vessels with no shoulders were less acute (150-170º) than vessels with a distinct shoulder (100-165º).

Body

Due to the lack of diagnostic attributes on the body potions alone, only sherd thicknesses were compared to surface finish (Table 53). The minimum and maximum widths were recorded but the location on the body was inconsistent because it depended on how much of the vessel was present. For example, the Dundurn vessels were found to have the thickest measurement but this was likely because the pieces were from near the base of the vessel. Measurements from incomplete vessels were taken from much higher up on the body since the bottoms were less preserved. The stamped surface finish tends to have the thinnest body portions and the smoothed vessels have the thicker ones, however,

all the surface finishes can become quick thin. Since the measurements were taken at different locations on the vessels, all of these measurements have some degree of error.

Table 53: Body width compared with surface finish.

Surface Finish	Min Width (mm)	Max Width (mm)	Avg Width (mm)	Vessel Count
Knotted Cord Impressed	7.8	12.6	10.5	2
Smooth	4	16.1	10.3	3
Dimpled	6.5	14.9	9.7	3
General Cord Roughened	6.4	13	9.7	6
Vertical Cord Roughened	5	16.4	9.4	22
Textile Impressed	8.7	10.1	9.2	2
Roughened	3.5	11.5	8.3	4
Stamped	4	12.6	7.7	2
Finger Impressed	5	10	7.5	1

Base Profiles

Bases are the least represented portion within this study. This is likely due to the poor preservation of the bottom of the vessel since it often comes into contact with the ground. Bases were recorded on 14 vessels from 11 sites (Table 54). All the bases were associated with complete vessel forms except for Vessel 7 from the Blakiston site. Four more potential base sherds were also identified but were not assigned a vessel number. These sherds were irregular and could not be confidently distinguished from shoulder sherds. These include one flat profile from Gull Lake and three round profiles from Sherwin Campbell.

Table 54: Base profiles by site.

Site Name	Base Profile			TOTAL
	Round	Flat	Tapering	
Blakiston	2			**2**
Bodo Bison Skulls	1	1		**2**
Cache	1			**1**
Dundurn		2		**2**
Fresno	1			**1**
Kenny	1			**1**
Piche Pot		1		**1**
Pouliot	1			**1**
Tipperary Creek		1		**1**
Tschetter			1	**1**
Walter Felt	1			**1**
TOTAL	**8**	**5**	**1**	**14**

Spatially, the round bases occur throughout the whole study area. The five flat bases tend to only show up in the eastern part of the study area. Preservation issues may have influenced this spatial distribution, but since round bases were found in southern Alberta and not flat bases, this argument it less convincing. Only eight bases have an associated time period (Table 55). Due to the small sample size, these data are less conclusive.

Table 55: Base profiles by time period.

Base Profile	Time Period			TOTAL
	Early	Middle	Late	
Flat	1		1	**2**
Round		3	2	**5**
Tapering	1			**1**
TOTAL	**2**	**3**	**3**	**8**

Round base profiles are seen with a variety of surface finishes including cord-roughened, dimpled, and smooth. The five flat bases, however, only have vertical cord roughened surfaces. The tapered base profile has a dimpled surface finish. The flat bases are also unique because they are only seen with flaring rims, while rounded bases are associated with vertical, flaring, and constricted rim profiles (Table 56).

Table 56: Base profiles with rim profiles.

Base Profile	Rim Profile			TOTAL
	Flaring	Vertical	Constricted	
Flat	5			**5**
Round	3	3	1	**7**
Tapering		1		**1**
TOTAL	**8**	**4**	**1**	**13**

Decorations

Decorative elements were recorded on 147 of the 300 vessels: 23.1% of lips, 28.3% of rims, 6.7% of necks, and 25.0% of shoulders had some form of decoration (Table 57). There was little spatial significance in the distribution of decorated vessels compared to non-decorated vessels. Fewer decorated vessels were located in the south along the Milk and Missouri Rivers, however, this is likely the result of sampling distribution. Spatial and temporal trends were further assessed on specific vessel portions.

The width, height, depth, and spaces between decorative elements were recorded and are provided in Appendix A (Table 84). Comparisons between these metric data did not yield any significant results. Sample sizes of specific element measurements on particular portions were not large enough to identify general trends. These measurements varied between vessels and even on the same vessel. This variability could simply be the result of individual differences or the material available to produce the decoration.

Table 57: Portion and vessel counts with and without decoration by site.

Site Name	Lip		Rim		Neck		Shoulder		TOTAL VESSEL COUNT	
	Deco	No Deco	Deco	No Deco	Deco	No Deco	Deco	No Deco	Deco	No Deco
Antelope Creek	5	21	5	21		13		1	10	16
Blakiston	3	2	3	2		4	1	3	5	2
Bodo Bison Skulls	2	11	4	9	3	7	2	2	9	5
Bodo Overlook	3	2	2	3		1			3	2
Bridgewater		2		2		2	1	1	1	1
British Block		2		2		1			0	2
Cache		2		2		2		2	0	2
Castleforks Buffalo Jump	1	4	1	4		3	2		3	2
Corey Ranch		1	1			1		1	1	0
DgPa-3	1	4	2	2		1		1	3	1
DgPa-4		2		2		2		2	0	2
Dundurn	2			2		2		2	2	0
EbPi-51		2	2			1			2	0
EbPi-52		1	1						1	0
EbPi-57	1	2	1	2		1			1	2
EbPi-63		2	1	1		2			1	1
EbPi-67		3	1	2		1			1	2
EbPi-73	1	10	1	10		6		1	2	9
EfOw-26		2		2		1		1	0	2
EgPm-82	1			1					1	0
EkPf-38		1		1		1		1	0	1
Ethridge		2		2					0	2
FM Ranch Campsite	2	1		3	1	1		2	2	1
Fresno	3	3	2	4		5		5	4	2
Garratt	8	4		12	1	5	1		9	3
Grassy Lake Cairn		3	1	2		3		2	1	2
Gull Lake	2	9	2	9	1	6		2	4	7
Head-Smashed-In	1	4	3	2		3		1	3	2
Hunter Valley	2	1	1	2		3	3		3	1
Junction Site	1	22		23		12		2	1	22
Kenny	1			1	1			1	1	0
Little Bow	3	9	6	6		2			7	5
Miry Creek	10	20	17	13	1	7		1	24	6
Morkin	2	13	5	10		6		3	7	9
Old Women's Buffalo Jump		1	1			1		1	1	0
Piche Pot	1			1		1		1	1	0
Pouliot		1		1		1		1	0	1
Ross	1	16	6	11		13	1	3	7	10
Rumsey Cairn		2		2	1	1	1		1	1
Saamis	3	15	7	11	1	7	3	1	9	10
Sherwin Campbell	4	16	3	17		7		1	7	13
Tipperary Creek	1			1		1		1	1	0
Trout Creek Campsite	2	2		4					2	2
Tschetter	1	3	2	2		2		1	3	1
Twitchell		2	2						2	0
Upper Kill							1		1	0
Walter Felt		1		1		1		1	0	1
TOTAL	68	226	83	210	10	140	16	48	147	153

Shaded areas indicates that none of that portion was available for study.

Lip Decorations

A total of 68 (23.1%) of the 294 vessels with a lip portion have a decorated surface and were found from 28 sites. Two vessels found at the Miry Creek site display two decorative elements on the lip. Vessel 26 has CWT impressions and angular impressions overlapping each other on the lip surface. Vessel 29 has CWT impressions and linear impressions. Therefore, 70 lip decorative elements were recorded in the dataset.

CWT impressions were found on 36 vessels (51.4% of vessels with decorated lips) and are the most frequent lip decorative element (Figure 59). The CWT impressions are more than three times more frequent than linear impressions which were recorded on 10 vessels (14.3%). Rare lip decorative elements include gouges, punctates, fingernail impressions, tiny punctates, and hollow impressions which only occur on one or two vessels.

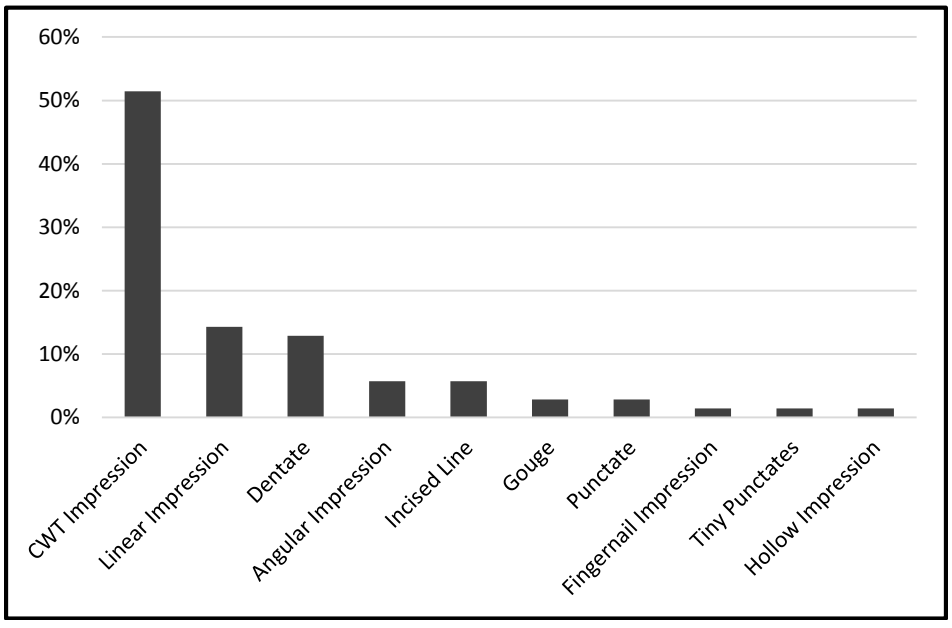


Figure 59: Percentage frequency of lip decorative elements.

The spatial distribution for individual decorative elements on the lip portion is not significantly clustered. Weak trends include the four vessels with angular impressions only showing up in the east, at the Gull Lake, Garratt, Piche Pot, and Miry Creek sites and the presence of dentate stamping on the lip portion is only found on vessels from sites along the South Saskatchewan River and the Bodo Overlook site. The temporal distribution appears to be even less significant, particularly because of the sample size (Table 58).

Table 58: Lip decorative elements by time period.

Decorative Element	Time Period			TOTAL
	Early	Middle	Late	
CWT Impression	5	7	6	**18**
Linear Impression	1	4	1	**6**
Dentate		1	1	**2**
Angular Impression			1	**1**
Fingernail Impression	1			**1**
Hollow Impression		1		**1**
Incised Line			1	**1**
TOTAL	**7**	**13**	**10**	**30**

There are 65 of vessels that have an identified lip profile and a decorative element. Data from the remaining three vessels with lip decoration were recorded from literature sources for EgPm-82 and Antelope Creek and profiles were not provided. Since there are two vessels from Miry Creek that have more than one decorative element, a total of 67 elements were counted. The most common lip profiles were associated with the most common decorative elements. CWT impressions were so common that they appeared on all available profiles (Table 59).

Table 59: Lip decorative elements with lip profiles.

Lip Profile	Decorative Element										TOTAL DECO. ELEMENT
	CWT Impression	Linear Impression	Dentate	Angular Impression	Incised Line	Gouge	Fingernail Impression	Hollow Impression	Punctate	Tiny Punctates	
Expanding (both)	14	4	2	1	2	1		1			25
Ext. Beveled	5	2	1	2							10
Expanding (both), Ext. Beveled	2	2			1		1				6
Ext. Expanding	5	1									6
Int. Expanding	1		1	1	1				1		5
Int. Flanged	2	1	1								4
Squared	1		1							1	3
Int. Beveled	2		1								3
Round	2					1					3
Int. Expanding, Ext. Beveled, Ext. Flanged	1										1
Ext. Expanding, Int. Beveled			1								1
TOTAL	35	10	8	4	4	2	1	1	1	1	67

Associated lip profiles and decorative elements that are less frequent have resulted in some rare combinations. Hollow impressions are present on an expanding lip profile on Vessel 3 from the Hunter Valley site. Vessel 2 from the Morkin site has two rows of deep gouges in an interlocking pattern on an otherwise round lip. This is the only vessel with more than one row of decorative elements of the lip surface. The tiny punctates on the lip surface on Vessel 2 from DgPa-3 on a squared lip profile are also unique. None of these vessels have associated dates and cannot be further analyzed. Lip profiles that do not have any form of decoration include expanding (both) with an interior bevel, exterior expanding with an interior bevel, interior expanding with an exterior bevel, exterior flanged, subround, and tapered.

The orientation was recorded for 68 lip decorative elements (Table 60). The orientation of the dentates on Vessel 18 from the Saamis site was not determined and the

tiny punctates on Vessel 2 from DgPa-3 were random. The majority (58.8%) of the elements are right oblique oriented. Vessels that have a zig-zag orientation are from the Garratt and Junction sites. Elements that are placed in a canaliculated pattern are small diamond shaped angular impressions, found on Vessel 14 from the Garratt site, and hollow impressions on Vessel 3 from Hunter Valley. The horizontally oriented CWT impressions are especially unique because Vessel 29 from Miry Creek also has vertical linear impression on the lip surface. The interlocking gouge decoration is on Vessel 2 from Morkin, which was previously mentioned with a rare round lip profile.

Table 60: Orientation of lip decoration

Lip Decorative Element	Orientation								TOTAL
	Right Oblique	Left Oblique	General Oblique	Vertical	Zig-zag	Canaliculate	Horizontal	Interlocking	
CWT Impression	27	5	1	2			1		**36**
Linear Impression	4	2	1	2	1				**10**
Dentate	3	4		1					**8**
Incised Line	3	1							**4**
Angular Impression	2			1		1			**4**
Gouge					1			1	**2**
Punctate				2					**2**
Hollow Impression						1			**1**
Fingernail Impression	1								**1**
TOTAL	**40**	**12**	**2**	**8**	**2**	**2**	**1**	**1**	**68**

Decoration on the lip surface was further compared with rim profiles and surface finishes (Table 61 and 62). Vertical rim profiles with CWT impressions make up 25.6% of the whole sample, though flaring rims with CWT impressions are also common: 17.9% of the sample. The rest of the decorative elements are less represented but all occur on the vertical rim profiles except for fingernail impressions. The less frequent rim profiles only have the most common decorative elements. Vertical cord-roughed surfaces are the most represented with lip decoration (33.9%). The decorative elements not

represented by any cord roughened surfaces include gouges, fingernail impressions, and tiny punctates. Gouge decorations are found on textile and smooth surfaces on Vessel 14 from Garratt and Vessel 2 from Morkin. The only lip decorations found on a vessel with a brushed surface finish are dentates found on Vessel 15 from the Morkin site.

Table 61: Lip decorative elements compared with rim profiles.

Lip Decorative Element	Rim Profile					TOTAL
	Vertical	Flaring	Constricted	Collared	Angled	
CWT Impression	10	7	2	2	1	**22**
Linear Impression	3		1		1	**5**
Dentate	3	1				**4**
Angular Impression	1	1				**2**
Incised Line	1	1				**2**
Fingernail Impression		1				**1**
Hollow Impression	1					**1**
Punctate	1					**1**
Tiny Punctates	1					**1**
TOTAL	**21**	**11**	**3**	**2**	**2**	**39**

Table 62: Lip decorative elements compared with surface finish.

Lip Decorative Element	Surface Finish							TOTAL
	Vertical Cord Roughened	Textile Impressed	Smooth	General Cord Roughened	Roughened	Dimpled	Brushed	
CWT Impression	19	4	2	4	1	1		**31**
Linear Impression	5		1					**6**
Incised Line	3			1				**4**
Angular Impression	2	2						**4**
Dentate	1		1		1		1	**4**
Gouge		1	1					**2**
Punctate	1				1			**2**
Fingernail Impression					1			**1**
Hollow Impression	1							**1**
Tiny Punctates			1					**1**
TOTAL	**32**	**7**	**6**	**5**	**4**	**1**	**1**	**56**

Rim Decorations

Decorative elements on the rim portions were recorded on 83 vessels from 27 sites. The analysis for rim decorative elements were separated into those that are on the

upper rim edge within 1 mm from the outer lip corner and those that are ore than 2 mm below the rim and lip transition. These were divided to showcase the differences in the frequency of elements that appear in each position. A total of 61 (73.5%) vessels have a decorative element on the upper rim edge compared to 26 (31.3%) that have at least one further down. Four vessels from the Bodo Overlook, Morkin, Saamis, and Tschetter sites have both the upper and lower portion of the rim decorated.

Upper Rim

Upper rim edge decoration was noted on 61 vessels from 23 sites. CWT impressions, finger pinches, and angular impressions make up 57.4% of these vessel decorations, followed by fingernail, finger, and linear impressions, incised lines, cord impressions, and tiny punctates, listed in frequency order (Figure 60).

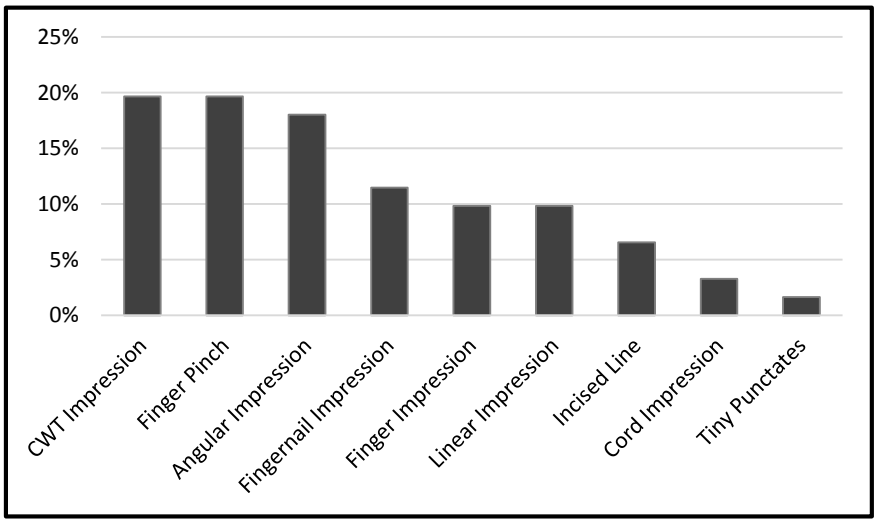


Figure 60: Percentage frequency of decorative elements on the upper rim edge.

Much of the spatial distribution is insignificant, however, it is notable that many upper rim decorative attributes are lacking from sites along the Bow River and Red Deer River. Vessel 3 from the Hunter Valley site is the only vessel near this area that has vertical linear impressions. The temporal distribution yielded interesting trends (Table

63). CWT and linear impressions were strongly represented in the earlier periods and appear to be replaced by finger pinches after approximately 650 BP. In fact, any decoration that is created using the fingers rather than a tool only occurs on vessels dated to the middle and late periods. Elements such as angular impressions, incised lines, and tiny punctates are too rare to suggest a temporal trend.

Table 63: Upper rim decorative elements with time periods.

Upper Rim Decorative Element	Time Period			TOTAL
	Early	Middle	Late	
Angular Impression			2	**2**
CWT Impression	7	1		**8**
Finger Impression			1	**1**
Finger Pinch		5	2	**7**
Fingernail Impression			1	**1**
Incised Line		2		**2**
Linear Impression	2	1		**3**
Tiny Punctates			1	**1**
TOTAL	**9**	**9**	**7**	**25**

Rim profiles were determined for 31 of the 61 vessels with an upper rim decoration. Vertical rims are associated with 83.9% of the 31 vessels. Finger pinches, finger impressions, and fingernail impressions are only associated with vertical rims. The rest of the elements display more variability (Table 64).

Table 64: Upper rim decorative elements with rim profiles.

Upper Rim Decorative Element	Rim Profile			TOTAL
	Vertical	Flaring	Angled	
Angular Impression	4	1		**5**
Cord Impression			1	**1**
CWT Impression	6	1		**7**
Finger Impression	3			**3**
Finger Pinch	7			**7**
Fingernail Impression	3			**3**
Incised Line		1		**1**
Linear Impression	3	1		**4**
TOTAL	**26**	**4**	**1**	**31**

Comparing frequencies of surface finishes with particular upper rim decorative elements resulted in interesting findings. Dimpled, textile impressed, brushed, finger impressed, and knotted cord impressed surfaces lacked any type of upper rim decoration. A total of 51 vessels had both an identifiable surface finish and the upper rim decorated (Table 65). Vertical cord roughened is the most common surface finish and is associated with all upper rim decorative elements except for tiny punctates. Vessel 19 at Saamis displays a stamped surface finished with tiny punctates, representing two rare attributes in this study assemblage.

Table 65: Upper rim decorative elements with surface finish.

Upper Rim Decorative Element	Surface Finish					TOTAL
	Vertical Cord Roughened	Roughened	Smooth	General Cord Roughened	Stamped	
Angular Impression	5	2	3			**10**
Cord Impression	1			1		**2**
CWT Impression	3	3	2			**8**
Finger Impression	4	2				**6**
Finger Pinch	10	1				**11**
Fingernail Impression	5		1			**6**
Incised Line	2					**2**
Linear Impression	3	1	1			**5**
Tiny Punctates					1	**1**
TOTAL	**33**	**9**	**7**	**1**	**1**	**51**

There are five vessels that have vertically oriented decorative elements on both the interior and exterior upper rim edge (Table 66). Most of these are CWT impressions except for the one vessel at Miry Creek with angular impressions. These attributes are not found on vessels that date after 500 BP.

Table 66: Vessels with decorative elements on both the interior and exterior of the upper rim edge.

Site Name	Vessel #	Time Period	Rim Decoration
Gull Lake	5	Early	CWT Impression
Little Bow	4	Middle	CWT Impression
Miry Creek	27		Angular Impression
Sherwin Campbell	2	Early	CWT Impression
Twitchell	1	Early	CWT Impression

Lower Rim

Lower rim decorations were only found on 26 vessels from 12 sites and ranged from 2.4 – 24 mm in distance from the outer lip edge. Since three vessels from Ross, Saamis, and Morkin have two separate elements on the lower rim portion, a total of 29 lower rim decorative elements were recorded. Punctates were found on six vessels from Morkin, Little Bow, and EbPi-51, making this decorative element the most common on the lower rim portion (Figure 61). Holes were found on five vessels and four had CWT impressions. Three of the vessel had multiple horizontal rows of CWT impressions. The remaining decorative elements were rare and only showed up on one or two vessels.

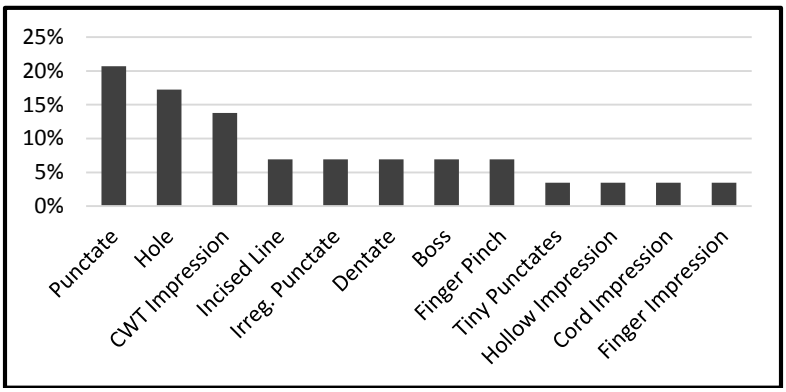


Figure 61: Percentage frequency of decorative elements on the lower rim.

The only vessel with a decorative element on the lower rim portion that had an associated date in the early period was Vessel 4 from the Tschetter site with horizontal

CWT impressions. The remaining decorative elements are associated with dates after 650 BP (Table 67).

Table 67: Lower rim decorative elements by time period.

Lower Rim Decorative Element	Time Period			TOTAL
	Early	Middle	Late	
Punctate		3		**3**
Hole		1	2	**3**
CWT Impression	1		1	**2**
Finger Pinch		2		**2**
Boss			1	**1**
Cord Impression		1		**1**
Hollow Impression		1		**1**
Tiny Punctate		1		**1**
Dentate			1	**1**
TOTAL	**1**	**9**	**5**	**15**

Comparisons between lower rim decorative elements with rim profiles and surface finishes did not result in significant findings (Table 68 and Table 69). The only noteworthy combination was finger pinches and collared rim profiles on two vessels from the Blakiston site. The pinches were placed at the bottom of the collared rim, before the vessel curved in toward the neck. These attributes are very unique within this study sample.

Table 68: Lower rim decorative elements with rim profiles.

Lower Rim Decorative Element	Rim Profile			TOTAL
	Vertical	Flaring	Collared	
CWT Impression	2	1		**3**
Punctate	3			**3**
Finger Pinch			2	**2**
Hole	1	1		**2**
Irreg. Punctate	1	1		**2**
Hollow Impression		1		**1**
Boss	1			**1**
Dentate		1		**1**
TOTAL	**8**	**5**	**2**	**15**

Table 69: Lower rim decorative elements with surface finishes.

Lower Rim Decorative Element	Surface Finish							TOTAL
	Roughened	Vertical Cord Roughened	Smoothed	General Cord Roughened	Knotted Cord Impressed	Dimpled	Stamped	
Punctate	2		2		1			**5**
Hole				2		1	1	**4**
CWT Impression	1	1						**2**
Finger Pinch		2						**2**
Boss				1	1			**2**
Irreg. Punctate	1	1						**2**
Finger Impression			1					**1**
Hollow Impression			1					**1**
Incised Line		1						**1**
Cord Impression	1							**1**
Tiny Punctate	1							**1**
TOTAL	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**22**

Not only did the elements found on the lower portion of the rim differ from those on the upper portion, so did the orientations of the elements (Table 70). Vertical oriented decorations continued to represent the majority of the sample (69.2%), which included generally symmetrical elements such as punctates, holes, and finger pinches. Of particular interest were the horizontal and the converging-inverted V patterns. The incised line in an inverted V pattern was found on Vessel 1 from EbPi-57. The horizontal decorative elements are also unique and the CWT impressions and dentates were found in multiple rows. These attributes will be discussed with the neck decorations to emphasize the similarities.

Table 70: Orientations of the lower rim decorations.

Lower Rim Decorative Element	Orientation				TOTAL
	Vertical	Horizontal	Converging/ Inverted V	Left Oblique	
Punctate	6				**6**
Hole	4				**4**
CWT Impression	1	3			**4**
Boss	2				**2**
Incised Line		1	1		**2**
Dentate		2			**2**
Finger Pinch	2				**2**
Tiny Punctates				1	**1**
Finger Impression	1				**1**
Hollow Impression	1				**1**
Cord Impression	1				**1**
TOTAL	**18**	**6**	**1**	**1**	**26**

Neck Decorations

Decorative elements on the neck portion of the vessel are rare. Only 10 out the 150 vessels with identified neck portions displayed any form of neck decoration. Vessel 14 from Bodo Bison Skulls has both horizontal CWT impressions and hollow impressions on the neck, adding to the 11 total neck decorative elements found in the entire study sample. Neck decorations are comparable with elements recorded on the lower rim portion. These portions were separated because the decorative elements were identified on the curved portion of the neck rather than the straighter rim portion.

The paddle-edge decorative element was found on three vessels and is the most common neck decoration (Figure 62). These were found on vessels from FM Ranch Campsite, Rumsey Cairn, and the Garratt site. The remaining neck decorative elements included incised lines, cord impressions, dentates, and punctates but their significance is small. Sites with decorated necks seem to be randomly distributed except that none of these vessels were from sites along the Milk or Missouri Rivers, though this may simply be a result of low neck portion being recovery.

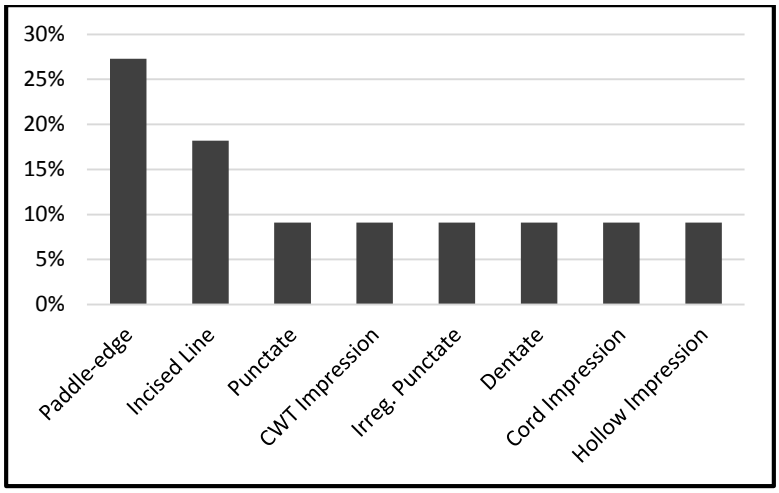


Figure 62: Percentage frequencies of neck decorative elements.

Only four vessels that have neck decoration have an associate date (Table 71). Vessel 1 from Gull Lake displays a minimum of six rows of horizontal cord impressions and is associated with an approximate date of 1220 BP. The paddle-edge decoration is on Vessel 3 from FM Ranch campsite with associated dates of approximately 700 BP. The two late period vessels include Vessel 18 from Saamis with horizontal dentates and Vessel 1 from Kenny with irregular punctates.

Table 71: Neck decorative elements by time period.

Neck Decorative Elements	Time Period			TOTAL
	Early	Middle	Late	
Cord Impression	1			**1**
Paddle-edge		1		**1**
Dentate			1	**1**
Irreg. Punctate			1	**1**
TOTAL	**1**	**1**	**2**	**4**

There are nine vessels that have both neck decoration and an identified rim profile. Vessels with constricted, collared, and angled rim profiles did not display any decorative elements on the neck. A total of five vessels with a decorated neck had a vertical rim and four had a flaring rim. Since there are very few elements, it is not possible to say which element is most commonly associated with which rim profile.

The percentage frequency of horizontally oriented decorative elements on the neck portion (37.5%) is higher than any other portion (Table 72). These elements include cord impressions, CWT impressions, and dentates. Vessel 28 from Miry Creek is the only vessel in this study that has a cross-hatched pattern.

Table 72: Orientation of neck decoration.

Neck decorative element	Orientation				TOTAL
	Vertical	Horizontal	Right Oblique	Cross-hatch	
Incised Line	1			1	**2**
Cord Impression		1			**1**
CWT Impression		1			**1**
Dentate		1			**1**
Punctate	1				**1**
Irreg. Punctate	1				**1**
Hollow Impression			1		**1**
TOTAL	**3**	**3**	**1**	**1**	**8**

Horizontally oriented decorative elements often occur in multiple rows and are only found on the neck and lower rim portion of the vessel. The lower rim and neck portions could be interpreted as the same area of the vessel. For example, Vessel 18 from Saamis has two rows of dentates of the lower rim and four rows on the neck, for a total of six rows. Only seven vessels display decorative elements in multiple rows of horizontal lines consisting of CWT impressions, cord impressions and dentates (Table 73).

Table 73: Vessels with multiple rows of horizontal rows.

Site	Vessel #	Decorative Element	Number of Rows
Bodo Bison Skulls	14	CWT Impression	3
Bodo Overlook	1	Dentate	2
Gull Lake	5	Cord Impression	6
Miry Creek	18	CWT Impression	2
Miry Creek	21	CWT Impression	3
Saamis	18	Dentate	6
Tschetter	4	CWT Impression	3

Shoulder Decorations

Out of the 63 vessels with a shoulder portion recorded, only 16 (25.4%) displayed evidence of decoration, found from 10 sites. With the exception of the Garratt site, all of these sites are located in the western portion of the study area. Finger pinching is the most common shoulder decoration and was observed on six vessels (37.5%) from four of the sites (Figure 63). Although there are only two vessels that display fingernail impressions and punctates, they show up at more than one site. Two vessels display angular impressions, but as with the remaining decorative elements, only occur at one site.

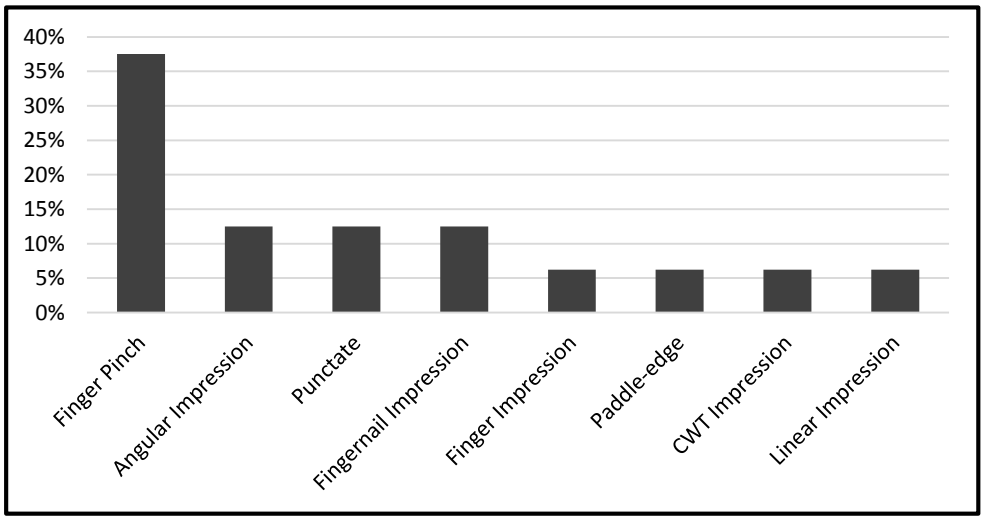


Figure 63: Percentage frequencies of shoulder decorative elements.

Approximate dates were associated with 11 vessels within a decorated shoulder. None of these vessels date before 650 BP (Table 74). This early period is interpreted as significant, but it is important to note that only six vessels with a recorded shoulder had an associated date in the early period. The majority of vessels with shoulder decorative elements date between 650 and 400 BP.

Table 74: Temporal distribution of shoulder decorative elements.

Shoulder Decorative Element	Time Period			TOTAL
	Early	Middle	Late	
Finger Pinch		4	2	**6**
Angular Impression			2	**2**
Finger Impression		1		**1**
Fingernail Impression		1		**1**
Punctate		1		**1**
TOTAL	**0**	**7**	**4**	**11**

Ten vessels with decorative elements on the shoulder had an identifiable rim profile. Finger pinching is seen on both vertical and flaring rims equally. The only other shoulder decoration on flaring rims includes paddle-edge elements. Other vessels on vertical rims include two with fingernail impressions and three with either CWT impressions, finger impressions, or punctates (Table 75).

Table 75: Shoulder decorative elements on rim profiles.

Shoulder Decorative Element	Rim Profile		TOTAL
	Vertical	Flaring	
Finger Pinch	2	2	**4**
Fingernail Impression	2		**2**
CWT Impression	1		**1**
Finger Impression	1		**1**
Paddle-edge		1	**1**
Punctate	1		**1**
TOTAL	**7**	**3**	**10**

The only decorative element found on a round shoulder consists of paddle-edge impressions on Vessel 2 from Rumsey Carin. The remaining decorative elements are found only on angled shoulder profiles, the most frequent being finger pinches (Table 76).

Table 76: Shoulder decorative elements on shoulder profiles.

Shoulder Decorative Element	Shoulder Profile		TOTAL
	Angled	Round	
Finger Pinch	5		**5**
Angular Impression	2		**2**
Fingernail Impression	2		**2**
CWT Impression	1		**1**
Finger Impression	1		**1**
Linear Impression	1		**1**
Paddle-edge		1	**1**
Punctate	1		**1**
TOTAL	**13**	**1**	**14**

Surface finish was identified on all 16 vessels with shoulder decorative elements. The paddle-edged decorative element is the only vessel with a dimpled surface finish. Vessel 19 from the Saamis site is the only vessel with a decorated shoulder with a stamped surface finish. The remaining shoulder decorations are associated with cord roughened surfaces, often vertically oriented (Table 77).

Table 77: Shoulder decorative elements with surface finish.

Shoulder Decorative Element	Surface Finish					TOTAL
	Vertical Cord Roughened	Smooth	Dimpled	General Cord Roughened	Stamped	
Finger Pinch	5			1		**6**
Angular Impression		1			1	**2**
Fingernail Impression	2					**2**
Punctate	2					**2**
CWT Impression	1					**1**
Finger Impression		1				**1**
Linear Impression	1					**1**
Paddle-edge			1			**1**
TOTAL	**11**	**2**	**1**	**1**	**1**	**16**

Body Decorations

The only decorative element found on the body of any of the vessels were paddle-edged. This was noted on sherds from three sites, including FM Ranch Campsite, Hunter Valley, and Rumsey Cairn. Other body sherds were decorated but could not be assigned

to a particular vessel. One sherd from EfOw-26 has a vertical linear impression, but since there is only one it might unintentional. A single sherd was also recovered from the Gull Lake site with incised lines in a cross-hatched pattern. The limited decoration on the body of the vessels is significant.

CHAPTER 5: Results

The variability in the ceramic attributes examined in this study showcase the difficulty of archaeological classification. It was not surprising that the analysis of data from 300 vessels dating from the end of Avonlea and throughout the Old Women's Phase produced highly variable results. Although several attributes were frequently represented, the dataset did not fit the criteria of a single ceramic type. Based on the shared paste and temper characteristics, along with similar technological and manufacturing methods, it could be argued that they do collectively consist of a ware. However, this classification would have to extend to all the Plains Woodland ceramic traditions, grouping them into the same ware category – Plains Woodland earthenware or North American earthenware. Based on the differences in surface finish, form, and decorative attributes, the whole sample should not be identified as one ceramic type, whether that type is named Ethridge ware or Saskatchewan Basin Complex: Late Variant. Several patterns of shared attributes were identified and warrant recognition. These trends were often obscured because they were not significantly clustered in particular regions and site assemblages rarely had consistent surface finishes, profiles, and decorative elements. The context in which these vessels were found was explored, along with the aspects that could have influenced the wide range of attributes.

Attribute Significance

The most frequent attributes were consistent with the descriptions of both Ethridge ware described by Kehoe (1959) and the Saskatchewan Basin Complex: Late Variant described by Byrne (1973). Ordering these attributes in production sequence as Rouse (1960:314) suggested, first by manufacturing technique, then by form, and then

decoration, was not possible. Byrne (1973) initially did this by grouping the surface finishes into primary classes and discussed the attributes found within each class. The current study revealed that similar forms and decorative attributes were associated with more than one surface finish. For example, separating by surface finish would have resulted in the division of two very similar vessels, such as Vessel 1 from Head-Smashed-In Buffalo Jump with a brushed surface finish and Vessel 1 from Bridgewater with a vertically cord-roughened surface. These vessels have similar rim and shoulder shapes and both have relatively tall rim and neck heights. This method would have produced a variety of new types based on only a few vessels and would ultimately obscure some interesting aspects about the artisans who made them. For these reasons, it was decided that the hierarchal taxonomic approach was not an appropriate classification method for ceramics in the Northwestern Plains.

Tracing the attributes directly proved to be the most interesting, though more complex, approach. Particular attributes in each category were defined as frequent, less frequent, and rare within the dataset (Table 78). Combinations of surface finish, form, and decorative elements were noted and assessed within their spatial and temporal contexts. Consistent surface finish, form, and decorative elements needed to co-occur to be considered a ceramic type.

Table 78: Attributes found on Old Women's Pottery.

Attribute Category	Frequent (>20 Vessels)			Less Frequent (6-20 Vessels)	Rare (1-5 Vessels)	
Surface Finish	Vertical Cord-roughened Smooth			Dimpled Textile Impressed	Check-Stamped Fingertip Impressed Knotted Cord-roughened Brushed	
Form	**Rim** Vertical Flaring	**Shoulder** Round Angled	**Base** Round Flat	**Rim** Constricted	**Rim** Collared Angled	**Shoulder** None
Decoration (on various portions)	No Decoration Finger Marked CWT Impressions			Punctate Single Cord-Impressions Dentate	Tiny Punctates Gouge Irreg. Punctate Paddle-edge Hollow Impression Any Neck Decoration	

Surface Finishes and Temper

Although often obscured by partial or complete smoothing, vertical cord-roughened surfaces were the most represented within the dataset. Dimpled surface finishes, described by Byrne (1973) as fabric/net impressed and are similar to what Young (2006) interpreted as twined fabric impressions on Selkirk pottery, are more commonly found on Avonlea, Selkirk, and other woodland pottery types. Its occurrence in Old Women's Phase contexts is less frequent and rarely found with other more common attributes in this collection. Check-stamped and brushed surface finishes were also rare, which was not surprising since they have been previously linked with Cluny and Mortlach vessels (Byrne 1973; Walde 1995, 2003). The Junction, Saamis, and Fresno sites were the only sites identified with the check-stamped finish. Given that the frequency of this finish is so low and occurs only in the Late Period, it is likely that this attribute is a result of Cluny influence rather than a consistent trait of Old Women's Phase pottery characteristics. Similarly, the only occurrence of the brushed surface finish

is at the Morkin site and Head-Smashed-In Buffalo Jump. Byrne (1973) included the brushed surface finish as a Cluny trait. The rarity of the brushed surface finish in this study supports this interpretation. The finger impressed surface finish that is seen at the Saamis site is also unique to the Old Women's Phase, but is not known on any other pottery styles.

Vessel thickness and paste were less significant in the current study than originally hypothesized. The paste and temper consisted mostly of poorly compressed, organic rich clay mixed with crushed granite. Changes in the consistency varied within the sherd and were not conclusive. The thickness of individual portions was measured, but differed depending on the portion of the body that was chosen. Most of the sherds in the dataset are relatively thick walled which is consistent with Old Women's Phase pottery descriptions.

Form

Profile form attributes were difficult to assess if only a small portion was present. Vertical and flaring rims were the most frequent forms in the Old Women's Phase. Collared and angled rim forms were rare and have been noted in Mortlach and Cluny vessels. Constricted rims are more common in Avonlea vessels. The occurrence of these profiles in assemblages that have been identified as part of the Old Women's Phase, such as the Garratt and Ross sites, is quite significant. Seeing these rim profiles at sites that have possible mixed components is less surprising. The two collared vessels from the Blakiston site are a unique shape of collared rim and has only been previously identified on the Lord Vessel (Walde and Meyer 2003).

The results of shoulder profile frequencies determined that angled and round profiles were frequent during the Old Women's Phase. Vessels lacking a distinct shoulder were only found on five vessels and are considered rare within the assemblages. Base form was an important attribute but with only 14 bases identified it was not a sample size to confidently evaluate its reflection of Old Women's Phase pottery types. However, all five of the flat bases identified were from the eastern half of the study area.

Lip profiles were less significant than expected. Classifying the high variation in the idiosyncratic nature of these forms was challenging to say the least. The lip portion is particularly sensitive to uneven pressure during the manufacturing process and a thin round lip should not be used as a significant anomaly unless a large portion of the vessel is present. Generally, lip forms were flat, and expanding either to the interior, exterior, or both. The remaining profile forms were considered rare.

Decorative Elements

Decorative attributes were the most easily identified features. Most vessels had no evidence of decoration. The most common placements of decorative elements were on the lip surface, the upper rim edge, and the shoulder. Lower rim, neck, and body portions were rarely decorated. CWT impressions and finger pinches were the most common decorative attributes found in the collections. Tiny punctates, hollow impressions, and gouges, were so rare in the dataset that they could be either viewed as significant outliers or personal styles of the individual potter. Dentates were found on nine vessels and may indicate overlapping characteristics or some sort of interaction between Cluny or Mortlach cultural groups.

Paddle-edged decorative elements were also rare and were inconsistently found with a mixture of associated attributes, such as dimpled and vertical-cord roughened surface finishes, vertical and flaring rims, CWT impressions and hollow impressions on the lip, and finger pinches on the shoulder. Recognizing the uniqueness of this decorative element, it is understandable that Walde et al. (2010) suggested that the four vessels from Hunter Valley, FM Ranch Campsite, and Rumsey Cairn with the paddle-edged attribute be assigned to the distinct Hunter Valley Edge-Paddled type. This study adds Vessel 12 from the Garratt site, bringing the total to five. When these vessels were compared to the current dataset it was discovered that there are a number of inconsistencies in the shared attributes. There is not enough data to support the recognition of a separate ceramic type at this time. The paddle-edge decorative element should be recognized as unique attribute until more data are available to re-evaluate this type.

Reoccurring Attributes of Old Women's Pottery

Since this time period is currently known as the Old Women's Phase, it seems appropriate to refer to these vessels as Old Women's pottery. If this dataset was compared with Avonlea, Mortlach, Cluny, Selkirk, and other Plains Woodland assemblages there would be noticeable differences such as the frequency of thick walls, poorly compacted paste, crushed granite temper, and complex profiles. Having said that, there are also overlapping attributes. Even the vessels with the rarest attributes found within Old Women's Phase contexts could be grouped under Old Women's pottery, as long as it is not used as a definable type itself but as a term to communicate the variable trends of attributes found within a spatio-temporal context.

The identified trends of co-occurring attributes found within the dataset include 1) CWT impressions on the lip surface and flat bases, 2) CWT impressions on the upper rim edge, and 3) finger marked vessels with tall vertical rims, and angled shoulders. A number of rare attributes were connected with these co-occurring trends which highlight the complexity and variation of Old Women's pottery. Only one of these trends is consistent enough to be considered a distinct ceramic type. Vessels with tall vertical rims, angled shoulders, and finger marks have been preliminarily called the *Ross ceramic type* which is defined below.

Flat Bases and Cord-Wrapped Tool Impressions on the Lip Surface

Kehoe (1959) and Byrne (1973) both noted CWT impressions on the lip surface in their studies. A total of 35 vessels were identified with this decorative attribute in the current study collection, with a temporal range of 950 to 250 BP. Meyer (1988) suggested that flat bases were an eastern attribute, which was confirmed in this study. The combination of flat bases and CWT impressions on the lip surface was explored in more detail.

The five vessels with flat bases all had vertically cord-roughened surface finishes and a decorative element on the lip surface. Three of these vessels found from Dundurn and Tipperary Creek also have CWT impressions on the lip. One of the flat based vessels was from the Bodo Bison Skulls site and had incised lines on the lip and another flat based vessels was the Piche Pot with angular impressions on the lip. All of these vessels have a flaring rim, but shoulders vary from round to angled.

This particular combination is spatially interesting because all of the sites are toward the east in the study area, but it is uncertain whether this recovery represents an

accurate distribution. Vessel 15 from the Bodo Bison Skulls site has an associated date of approximately 150 BP. Vessel 1 from Tipperary Creek was likely associated with material which dates to approximately 800 BP, but the context is unclear and the date should be used with caution.

Since the sample of five vessels with flat bases was so small, the 35 vessels with CWT impressions on the lip surface were compared with other attributes. There was little to no consistency in rim or shoulder forms. Surface finish was mostly vertical cord-roughened, with some degree of smoothing or was completely obliterated. Three vessels from the Garratt site and one from Sherwin Campbell have textile impressed surface finishes. Unfortunately, little remains from these vessels so no profile form is known. Vessels 6 and 9 from the Garratt site appear to be very similar and the CWT impressions are 4.9-6.7 mm wide. Vessel 1 from the Garratt site also has CWT impressions on the lip surface, but displays a vertical cord-roughened surface. The CWT impressions on this vessel are significantly thinner, 1.6 mm wide, and appear to be made of a fine sinew. The walls of this vessel are also thinner than Vessels 6 and 9.

Vessel 1 from the Tschetter site has CWT impressions on the lip with a dimpled surface finish and is also simple in profile with no neck constriction. This profile shape is usually associated with Avonlea contexts, but since it was found with other complex vessel forms and 270 Prairie Side-notched projectile points (Prentice 1983), it supports the theory of transition from the Avonlea to Old Women's Phase. Several other vessels from the Tschetter site display CWT impressions on the upper rim edge, which will be described below as an early Old Women's pottery attribute.

The inconsistencies in surface finish, vessel form, and the wide temporal range makes CWT impressions on the lip surface difficult to associate with a single ceramic

type. The combination of flaring rims, flat bases, vertical cord-roughened surfaces, and decorated lips was more promising. However, the identification of only five vessels, potentially with a 650 year time span, is reason for uncertainty. Except for the flat bases, these attributes are found on a variety of other vessels within the dataset and other ceramic assemblages. The minimal data, inconsistent shoulder forms, and high temporal range prevents a confident typological group at this time.

Cord-Wrapped Tool Impressions on the Upper Rim Edge

The most notable temporal change is seen in the frequency of particular rim decorations. Only nine vessels displaying upper rim decorative elements were found in contexts earlier than 650 BP. CWT impressions were found on seven of the nine (78%) vessels. The remaining two (22%) have linear impressions which could simply represent an un-wrapped tool. Vessel 5 from the Gull Lake site and Vessel 4 from Tschetter have additional horizontal rows of CWT or cord impressions further down the rim and neck. Several vessels, including Vessel 5 from Gull Lake, Vessel 2 from Sherwin Campbell, and Vessel 1 from Twitchell, have a second row of CWT impressions on the interior surface. Complete vessels with decorated rims from this time period are rare; no bases are available and there are only two shoulders, both of which are round with no decoration. In many cases there was not even enough of the rim portion present to confidently determine orientation. The surface finish of these rim decorated vessels ranged from vertically cord-roughened to smoothed, some with a general roughened exterior, which could all represent the same initial surface treatment. This decorative element becomes less frequent after 650 BP and is not found in contexts dating later than 500 BP. Other

decorative elements became more prominent after 600 BP, particularly finger marks but also punctates, dentates, gouges, and cord impressions (Figure 64).

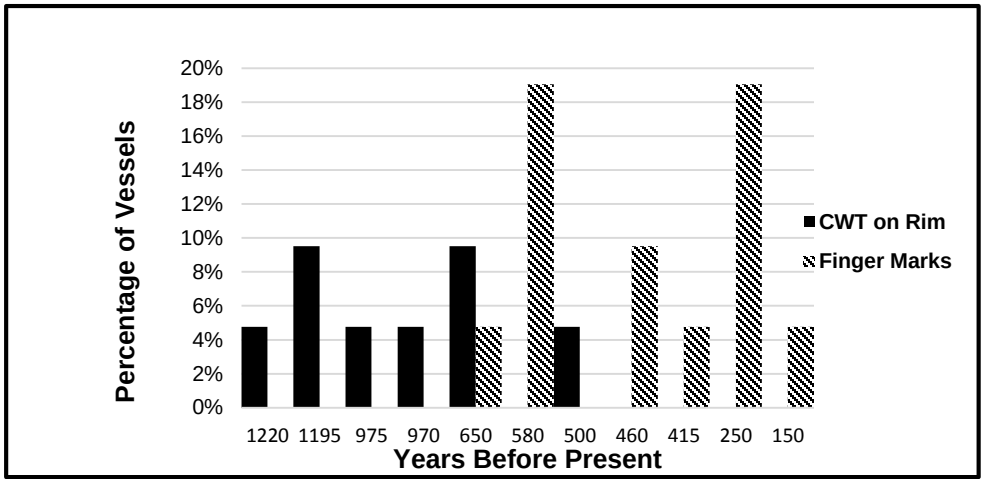


Figure 64: Frequency of vessels with either CWT impressions or finger marks on the upper rim at 12 sites ordered according to year.

It is debateable whether vessels with CWT impressions on the upper rim edge warrant a distinct typological group. Researchers who tend to split artifacts into more categories could argue, based on the temporal restriction, that this decorative style is best represented by a ceramic type of its own. However, the lack of data available to determine the corresponding attributes makes it difficult to argue for such a classification. Therefore, it is proposed that rather than separating these vessels into a type, this decorative trait be discussed simply as a distinct reoccurring attribute, at least until more data become available.

The Ross Ceramic Type: Finger Marks, Vertical Rims, and Angled Shoulders

At approximately 700 BP, corresponding with the shift from Prairie to Plains Side-notched projectile points, the upper rim CWT decorative element quickly decreased in frequency and a variety of other decorative elements spread throughout the study area.

The most common of these were finger pinches, finger impressions, and fingernail impressions. These decorative elements were initially separated for the analysis, but were interpreted together as finger marks because they often look similar depending on the amount of pressure the artisan put on a particular portion of the finger and how long their fingernails were. The changes in finger size, pressure, and nail length were considered personal variables. Finger marks were found on 33 vessels. These marks were located on the upper rim edge of 28 of the 33 vessels and four of these also had finger marks on the shoulder. Five had marks on the shoulder only and not on the rim. Temporal data were available for 16 of 33 vessels with finger marks, which ranged from approximately 730 to 150 BP (Figure 64).

Unlike the upper rim CWT impressions, there was a trend in the profile forms associated with the finger marked decorative elements. Rim profiles were determinable on 19 vessels with finger marks, 15 of which (79%) are vertical, two (10.5%) are flaring, and two are collared, the latter coming from the Blakiston site. These Blakiston vessels are similar to the Lord Vessel described by Walde and Meyer (2003). Shoulder portions from nine vessels were available for analysis and all had an angled form.

Vertical cord-roughened surfaces were identified on 77% of the finger marked vessels and the remaining 23% ranged from general cord-roughened to smooth. The rim and neck height appears to be proportionately higher compared to some other short, flaring rims. At least six other vessels from EfOw-26, Grassy Lake Carin, Bridgewater, and DgPa-4 have similar rims, shoulders, rim and neck lengths, and surface finishes but lack any decorative elements. Lip decoration was found on eight of the 33 vessels with finger marks. The combination of the relatively vertical rims, angled shoulders, tall rim and neck heights, consistent surface finishes, and the finger marked decorative elements

provided enough evidence to consider distinguishing them typologically. Furthermore, the frequency of these attribute combinations appearing after 700 BP in contexts with Plains Side-notched projectile points further supports this interpretation.

These vessel attributes were included in Kehoe's (1959) original definition of Ethridge ware. Classifying them under the *Ethridge type* was considered but this trend could not be confirmed at the Ethridge site. Wedel's (1951) description of the pottery found at the Ethridge site included rims and shoulders, some having vertical or diagonal notches, and one rim with CWT impressions on the lip surface. Although these attributes are found on other vessels within the study, there are not enough data to link them with the type description. Vessels from Ross, Grassy Lake Crain, and Old Women's Buffalo Jump that were originally assessed by Forbis (1960, 1962), Griffin (1965), and Wormington and Forbis (1965) do fit the type attributes identified in this study. These earlier descriptions noted similarities between the Grassy Lake Cairn and Ethridge site based on the three different surface finishes at both sites. The vessels from the Ross and 24TL26 (Galata) sites were both described as having the same finger pinched rim and shoulders, but unfortunately data were not available for the Galata site. If a typological group is going to be used to describe these vessels, it is suggested that rather than the *Ethridge type*, this combination of attributes be referred to as the *Ross ceramic type*. This term credits one of the first sites that this ceramic type was identified, the Ross site, which has the highest number of vessels of the type in its assemblage and it is spatially located in the center of the distribution area.

There are a total of 13 vessels from eight sites that match the description of the proposed Ross ceramic type (Figure 65, Table 79). Four of these vessels do not have the finger marked decoration but surface finish and form attributes are consistent with the

Ross ceramic type. These range in time from approximately 580 to 300 BP. An additional 15 vessels from 11 sites have finger marks, but are too small to determine vessel form and one vessel has no decoration but is also poorly preserved (Table 80). Their dates range from 580 to 250 BP. Another 11 vessels from 10 sites, with dates ranging from approximately 700 to 150 BP, have similar characteristics but differ because they lack one of the attributes or have a decorative element on the lip surface (Table 81).

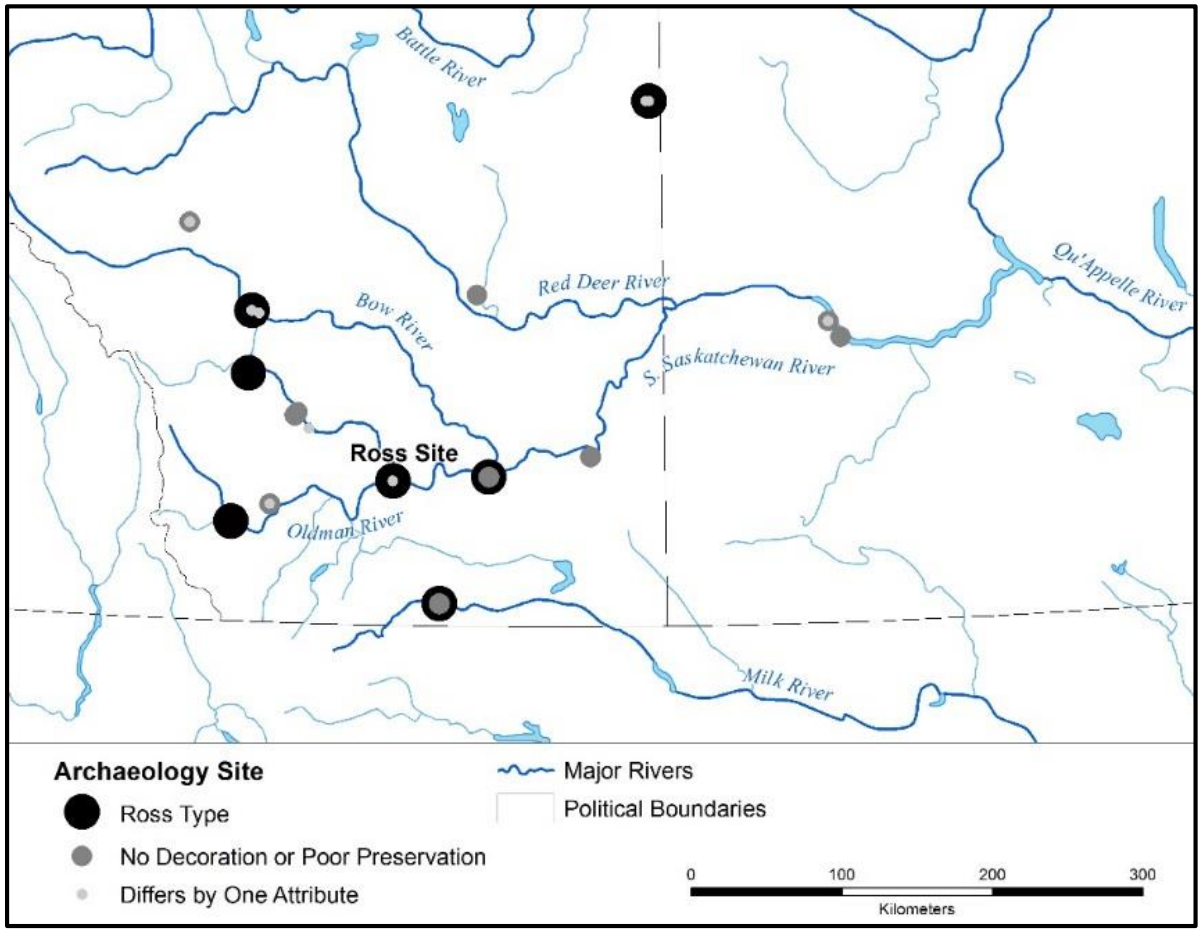


Figure 65: Map showing the location of archaeology sites with vessels identified as the Ross ceramic type, vessels that could potentially represent the Ross ceramic type, and those that differ in one attribute.

Table 79: Vessels identified as the Ross ceramic type.

Site	Vessel #	Approximate Date	Finger Marked
Bodo Bison Skulls	2		Yes
Bridgewater	1		No
Castleforks Buffalo Jump	1	460	Yes
Castleforks Buffalo Jump	5	460	Yes
DgPa-3	1		Yes
DgPa-4	2	300	No
Grassy Lake Cairn	1		No
Grassy Lake Cairn	2		No
Old Women's Buffalo Jump	1		Yes
Ross	2	580	Yes
Ross	3	580	Yes
Ross	1	580	Yes
Ross	12	580	Yes

Table 80: Vessels that potentially represent the Ross ceramic type but the preservation is too poor for certainty.

Site	Vessel #	Approximate Date	Description
Antelope Creek	21		Rim Only
DgPa-3	3		Rim Only
EbPi-52	2		Rim Only
EbPi-63	2		Rim Only
EbPi-73	5		Rim Only
EfOw-26	1	260	No Decoration – rim and shoulder do no refit
Grassy Lake Cairn	3		Rim Only
Head-Smashed-In	2		Rim Only
Hunter Valley	4	415	Shoulder Only
Miry Creek	17		Rim Only
Miry Creek	19		Rim Only
Miry Creek	30		Rim Only
Saamis	1	250	Rim Only
Saamis	2	250	Rim Only
Saamis	6	250	Rim Only
Saamis	9	250	Rim Only

Table 81: Vessels that differ from the Ross ceramic type by one attribute.

Site	Vessel #	Approximate Date	Description
Bodo Bison Skulls	1		Rim only; R: Fingernail
Bodo Bison Skulls	15	150	L: Incised line; S: Pinch
Bodo Overlook	4		Rim only; L: Dentate; R: Pinch and Dentate
Bridgewater	2		Same shape; S: Punctates; no finger marks
FM Ranch Campsite	8	700	Same shape; L: CWT, Paddle edge, no finger marks
Head-Smashed-In	1		Same shape; brushed surface, no deco
Hunter Valley	2	415	Same shape ; L: CWT ; S: Pinch; Paddle-edge
Hunter Valley	3	415	Same shape; L: Hollow Impr.; R: Linear Impr.; S: Pinch; Paddle-edge
Little Bow	4	500	Same shape ; R:CWT
Miry Creek	24		Rim only; L: Dentate; R: Finger Impr.
Ross	9	580	Same rim shape, dimpled surface

Similar Attributes in Adjacent Types

Assessing other ceramic assemblages was not within the scope of this project but some overlapping similarities were recognized when the dataset was compared to other documented assemblages. The surface finishes, profile forms, and decorative elements identified on Old Women's pottery are not restricted to the Northwestern Plains.

CWT and cord impressed decorative attributes are also found within ceramic types including Laurel and Blackduck. Laurel cultural material ranges north and west of the Great Lakes and throughout the Boreal Forest of Manitoba and Saskatchewan. Evidence suggests that Laurel populations were interacting with Avonlea groups in the central part of Saskatchewan around AD 500-1000 (Meyer and Epp 1990). At approximately AD 800, Laurel material was replaced with Blackduck forms in northern Minnesota, southeastern Ontario, and southern Manitoba, which marks the beginning of the Late Woodland Period (Syms 1977; Meyer and Hamilton 1994). Blackduck pottery has been described as globular in form with constricted necks and flaring rims. Surface finishes are usually vertically cord-roughened. Rims are often decorated with complex motifs of oblique and vertical CWT impressions and punctates (Meyer and Epp 1990:334). Similar attributes are found on Old Women's pottery though Blackduck vessels are thinner and more compact, and have more complex and refined decorative motifs.

Meyer and Epp (1990) investigated the interaction between cultural groups sharing the parkland during the spring and summer seasons. A possible brief temporal overlap between Laurel and the Old Women's Phase was suggested in central Saskatchewan, but unfortunately no site component has yet been identified that supports either a Laurel or Blackduck interaction with the Old Women's Phase (Meyer and Epp

1990:328-333). If interaction occurred, it would have likely been at the southern edge of the forest in Saskatchewan, but due to the lack of overlapping territory, it is possible that contact was avoided (Meyer and Epp 1990:334). Old Women's pottery has been found in surface collections throughout the parkland, but the only Old Women's site excavated in the parkland is the Lucky Strike site, which yielded Prairie Side-notched points and some thick non-diagnostic sherds (Wilson 1984; Meyer and Epp 1990:333).

Similar ceramic attributes including punctates, rounded shoulders, and flaring rims have been recognized on Selkirk composite pottery types to the north. Paquin (1995) suggested that there are similarities between Old Women's pottery and the Narrows assemblages of the Selkirk composite at the Ice House site in the Parkland region of Saskatchewan. These vessels are tempered with sand and are thinner than most Old Women's pottery (Paquin 1995:171). Young (2006) further explored this possibility when he examined the Narrows Fabric-Impressed ware recovered from around Peter Pond Lake in north-west Saskatchewan; however, his conclusions highlighted connections with Sandy Lake ware from the east rather than with Old Women's pottery. Although studies of the relationships between the people occupying the Boreal Forest and the Plains regions have been carried out, there is little evidence to support a Selkirk and Old Women's Phase interaction (Meyer and Hamilton 1994).

Finger marks are commonly found on Vickers Focus and Sandy Lake vessels which started appearing in South Dakota as early as 900 BP (Nicholson et al. 2010:23). Other decorative attributes, including incised lines, lip punctates, linear impressions, cord impressions, and punctates, are found on a variety of other ceramic types related to the Eastern Woodland, Plains Woodland, and Middle Missouri cultures. Finger marks found on Old Women`s pottery could represent connections with all or any of them.

Rare attributes including dentates, check-stamped surface finishes, and tiny punctates are more common on Old Women's pottery after 400 BP. These attributes are also found more frequently on Mortlach and Cluny pottery (Walde 2003). Check-stamped surface finishes have been recorded at the Fresno and Junction sites. This attribute has been considered an indicator of Cluny and Mortlach pottery and has been the topic of much debate regarding the typological assignment of these vessels (Keyser and Byrne 1980; Walde 2005). Vessels that have a combination of frequent and rare attributes need not be restricted to a typological barrier. It is more realistic to interpret these attribute combinations as unique expressions of overlapping influences unless more vessels with specific combinations are found.

Similar ceramic attributes found on Old Women`s pottery and on adjacent pottery types supports Syms' (1977) Co-Influence Sphere Model. Syms (1977) suggested that due to changes in climate and subsistence strategies for the Plains Village societies, increased social interaction would have taken place as far as the Northwestern Plains and Boreal Forest regions. Syms (1977:83) hypothesized that the Laurel Composite represented a movement of displaced people from the emerging Hopewell cultures along the Mississippi River. The shift from Laurel to Blackduck material culture is coeval with the maximum extent of the Mississippian cultural expansion and with the warmer temperatures and moister climate of the Neo-Atlantic episode -- Climatic Optimum (Baerreis and Bryson 1965; Bryson and Wendland 1967; Syms 1977; Gibbon 1994). Blackduck subsistence strategies ranged from bison hunting and wild rice horticulture on the plains of Manitoba and Minnesota, forest adaptations in Ontario and Manitoba, and included parkland resources in Saskatchewan (Syms 1977; Gibbon 1994; Meyer and Hamilton 1994; Walde et al. 1995). Kehoe (1966:839) and Dyck (1983:126) both

recognized that the Prairie Side-notched projectile point used in the Northwestern Plains was similar to those in Blackduck components.

Although direct evidence explaining changes in ceramic variability cannot be confirmed, it is possible that the shifting social patterns affecting the Mississippi Woodland and Blackduck cultures at 1200 BP, which corresponded to warmer temperatures and the transition from the Avonlea to the Old Women's Phase, also influenced changes in ceramic making practices. Notable changes in ceramic variation are seen again around 650 BP, particularly in the range of decorative elements. This transition corresponds to the shift from Prairie to Plains Side-notched projectile points (Kehoe 1966). The increased variability in ceramics and shift in lithics appears to be correlated with the end of the Neo-Atlantic and the start of the Pacific Climate Episode (Baerreis and Bryson 1965; Bryson and Wendland 1967; Syms 1977; Gibbon 1994). Temperatures started to drop, there was a decrease in rainfall, and the Plains ecoregion expanded, encroaching into the north and eastern Woodlands. Stress on the sedentary, horticultural practices of the Eastern and Plains Woodland populations can be identified by the abandonment of Middle Missouri sites such as Cahokia (Syms 1977:139).

These ecological culture-history models seem to relate to changing Old Women's Phase ceramic assemblages. It is likely that small bands moved west to take advantage of the rich bison resources when villages could not support large populations. The large range of ceramic attributes found on Old Women's pottery, even within the same site assemblages could be explained by the waves of mixing populations bringing different pottery styles.

CHAPTER 6: Conclusions

The analysis of ceramic artifacts found on the Northwestern Plains from 1200 to 200 BP was a large and challenging, yet rewarding, project.

The main objectives of this study were to:

1. Provide an updated description of pottery from this time period;
2. Determine whether or not there is enough attribute consistency between the analyzed vessels to include them in a typological group or groups; and
3. Assess whether regional and temporal patterns can be identified within the vessel attributes over the 1000 year time span.

Ceramic vessels recovered from late Avonlea and Old Women's Phase contexts display a wide range of surface finishes, profile forms, and decorative elements. The frequency of vessels with vertical cord-roughened surface finishes is significant, many of which were partially to completely smoothed. The lack of consistency within the shared attributes is also relevant, which leads one to suggest that the artisan was less concerned about the consistency of a single ceramic type associated with the societal norm. Changes in ceramic variability during the Old Women's Phase are coeval with changes in Laurel and Blackduck ceramics, and with the arrival of Mortlach pottery to the east.

Trying to define typological groups of Old Women's pottery based on a combination of surface finish, form, and decorative attributes is challenging. The term used by archaeologists to describe a group of vessels with similar attributes is less significant than the attributes that define it. A typological group is used to communicate a set of attributes that co-occur on vessels within similar cultural and spatio-temporal contexts. Not all vessels will fit into a definable ceramic type, nor should they be forced into one. It ultimately comes down to which attributes are emphasized over another.

The only potential group of typologically distinct vessels were identified as the Ross ceramic type. These vessels have similar surface finishes, form, and decorative elements. Only 13 vessels could be confidently grouped into the Ross ceramic type and this was the most cohesive group of similar vessels from the sample of 300 examined in this study. Compared to site assemblages of over 1000 vessels, it would be not be difficult to argue that these 13 to potentially 29 vessels may only represent one band or family that was particularly fond of this style. Does one family unit warrant their own ceramic type? Did they represent the societal norm? This is particularly questionable considering the small sample size. The purpose for defining ceramic types is to make it easier to communicate trends in their attributes. It is cumbersome to describe each vessel with a vertical cord-roughened surface finish, a vertical rim, and angled shoulders that often have finger marks. The Ross ceramic type should be used for the ease of denoting a set of ceramics attributes first found at the Ross site. For vessels that do not have these characteristics, unfortunately, the wordy explanations must continue.

The artisans making these vessels were not living within a closed system. They were influenced by numerous factors in their diverse nomadic lifestyle. Attributes found on vessels that do not match the Ross ceramic type description, such as round shoulders, sharply flaring rims, dimpled surface finishes, or dentate stamping, should be evaluated in this context. Idiosyncratic variation should not be dismissed but the frequency of differing attributes should be compared to neighbouring pottery types.

Old Women's pottery can be divided into early (1200 to 650 BP) and late (650 to 150 BP) time periods, with increased variability after 400 BP. Upper rim CWT impressions tend to occur in the early period, while finger pinches, finger nail impressions, and finger impressions have higher frequencies in the late period. These

finger marked vessels also display vertical cord-roughened surfaces that were often smoothed, tall vertical rims, and angled shoulders. The Ross ceramic type recognizes the consistency of these attribute combinations. The late period was met with increased variability, including finger impressed and check-stamped surface finishes, flaring and vertical rims, round and angled shoulders, and decorative attributes including, linear and angled impressions, punctates, dentate stamping, and paddle-edge impressions. Beyond the general trends, the temporal data were inconclusive. The only attributes with potential spatial significance are flat bases. Since only five vessels were identified with this attribute, it is a less convincing distinct ceramic type. CWT and linear impressions on the lip surface were found throughout all time periods.

Spatial statistics including Moran's I and Getis-Ord General G tests were conducted for every attribute. However, the results consistently noted sites with the highest number of vessels or, when converted to percentage frequencies, overrepresented an attribute. The small sample size of particular attributes also contributed to a lack of confidence in the statistical tests. Since the sample was not randomly distributed, the Moran's I and Getis-Ord General G tests were deemed to be unreliable for this dataset. These tests may be useful in future studies if more vessels and sites are included. The Old Women's Phase may have an actual concentrated spatial distribution in southern Alberta; however the tests may simply be denoting the higher number of archaeological projects in areas in Alberta.

Some of the less frequent decorative attributes are more common in neighbouring ceramic types and their occurrence on thick walled, coarse tempered pottery supports theories of Plains Woodland population shifts and interactions with the people living on the Northwestern Plains during the Old Women's Phase. It was hypothesized that clusters

of ceramic attributes would be identified to refine the spatial and temporal distributions from southern Alberta, Saskatchewan, and northern Montana. This hypothesis was shown to be true, but most of these clusters were not distinct enough to warrant typological classification, other than the Ross ceramic type.

As more ceramic artifacts are recovered from undisturbed contexts, the factors that influenced these ceramic characteristics may become better understood. Trends identified in this study may eventually warrant recognition as types. For now, we should view these vessels as representations of the cultural diversity that existed on the Northwestern Plains during the Old Women's Phase.

Future Research

It has been emphasised throughout this thesis that future research should emphasize the attributes in more detail. This approach opens opportunities to go beyond culture-history studies. Ceramic variation is not restricted to ethnic differences. It could also represent environmental settings, availability of resources, local traditions, trading patterns, status, gender identities, marriage patterns, and religious beliefs (Trigger 2006:309). Attempts should be made to explore the connections between these vessels and the people that made and used them.

Technological attributes used in this study focused primarily on surface finish, which was assumed to be related to manufacturing technique. Though surface finish can be an indicative attribute of manufacture, there are multiple ways to get similar surface treatments. Exploring differences in surface finish application may yield interesting results. In addition, as residue analysis becomes more conclusive, functional attributes may also be incorporated. The presence of residue was recorded but not used within this

study (Appendix A, Table 82). More research should be conducted on the technological attributes, such as manufacturing techniques, raw material procurement, and the function of these vessels.

REFERENCES CITED

Ashmore, Wendy, and Robert J. Sharer
1999 *Discovering our past: A brief introduction to archaeology*. McGraw-Hill Humanities/Social Sciences/Languages.

Adams, Gary F.
1977 *The Estuary Bison Pound Site in southwestern Saskatchewan*. Archaeological Survey of Canada Paper No. 88. National Museum of Man Mercury Series, National Museums of Canada, Ottawa.

Baerries, D. A., and R. A. Bryson
1965 Climatic Episodes and the Dating of the Mississippian Cultures. *The Wisconsin Archaeologist* 46(4):203-220.

Blaikie, Kurtis Alexander
2005 *Archaeological Investigations of FaOm-1: The Bodo Bison Skulls Site*. Master's thesis. Department of Anthropology, University of Alberta.

Bower, Carolyn Jane
1973 *Petrographic Studies for Northwestern Plains Ceramics*. Master's thesis. Department of Archaeology, University of Calgary.

Brink, Jack and Bob Dawe
1989 *Final Report of the 1985 and 1986 Field Season at Head-Smashed-In Buffalo Jump, Alberta*. Archaeological Survey of Alberta Manuscript Series No. 16. Edmonton.

Brink, J., Milt Wright, Bob Dawe, and Doug Glaum
1985 *Final Report of the 1983 Season at Head-Smashed-In Buffalo Jump, Alberta*. Archaeological Survey of Alberta Manuscript Series No. 1. Edmonton.

1986 *Final Report of the 1984 Season at Head-Smashed-In Buffalo Jump, Alberta*. Archaeological Survey of Alberta Manuscript Series No. 9. Edmonton.

Brumley, John H., and Barry J. Dau
1988 *Historical Resource Investigations within the Forty Mile Coulee Reservoir*. Manuscript Series No 13. Archaeology Survey of Alberta, Edmonton.

Bryson, R. A., and W. M. Wendland
1967 Tentative Climatic Patterns for Some Late-Glacial and Post-Glacial Episodes in Central North America. In *Life, Land, and Water*. W.M Mayer-Oakes, ed. University of Manitoba, Winnipeg. Pp 271-298

Byrne, William J.
1973 *The Archaeology and Prehistory of Southern Alberta as Reflected by Ceramics*. Manuscript Series No 14. Volume 1-3. National Museum of Man. Ottawa.

Chilton, Elizabeth S.
1999 One Size Fits All: Typology and Alternatives for Ceramic Research. In *Material Meanings: Critical Approaches to the Interpretation of Material Culture*. E.S. Chilton, ed. Pp. 44-60. University of Utah Press, Salt Lake City.

Clarke, Grant M.
2000 *Alberta Ethane Gathering System (AEGS), east Leg, Historical Resources Impact Mitigation (ASA Permit 1999-122).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Damkjar, Eric
1995 *Final Report of the 1991 and 1992 Mitigative Excavations at Head-Smashed-In Buffalo Jump (DkPj-1 and Dersch Site (DkPj-35*) *(ASA Permit 1992-022).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Dau, Barry J.
1997 *Oldman River Dam Prehistoric Archaeology Mitigation Program Technical Series, No 3, Stone Features Study*. ASA Permits 1988-034, 1989-042, and 1990-018. Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Dawson K. C. A
1977 An Application of the Direct Historical Approach to the Algonkians on Northern Ontario. *Canadian Journal of archaeology*, No. 1:151-181, Ottawa.

de Mille, Christy
1997 *Final Report, Historical Resources Mitigation Beddington Trail N.W. EgPm-82 (ASA Permit 1997-059).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Dyck, Ian G.
1972 *1971 Excavations at Four Sites in the Dunfermline Sand Hills, Saskatchewan*. Ms. On file, Department of Anthropology and Archaeology, University of Saskatchewan.

1983 The Prehistory of Southern Saskatchewan. In *Tracking Ancient Hunters: Prehistoric Archaeology in Saskatchewan*. Henry T. Epp and Ian Dyck, ed. Pp.63-139. Saskatchewan Archaeological Society, Saskatoon.

Evans, G. E.
1961 *A Re-appraisal of the Blackduck Focus or Headwaters Lake Aspect*. Master's thesis, University of Minnesota.

Ewers, John C.
1945 The Case for Blackfoot Pottery. *American Anthropologist* 47(2):289-299.

Fedirchuk, G. J.
1985 *Historical Resources Mitigation, Little Bow River Crossing, EaPh-4 and EaPh-5 (ASA Permit 1984-038/1984-049*). Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

1986 *Archaeological Investigations, The Little Bow Site, EaPh-4 (ASA Permit 1985-024)*. Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Forbis, Richard G.
1960 *Some Late Sites in the Oldman River Region, Alberta*. In National Museums of Canada Bulletin 162. Pp. 119-164. National Museum of Man. Ottawa.

1962 *The Old Women's Buffalo Jump, Alberta*. In National Museum of Canada Bulletin No. 180, Contributions to Anthropology, Part 1. National Museums of Canada. Ottawa.

Ford, James A.
1938 A Chronological Method Applicable to the Southwest. *American Antiquity* 3:260-264.

1954 Comment on A. C. Spaulding, "Statistical Techniques from the Discovery of Artifact Types". *American Antiquity* 19(4):390-391.

Forner, Cheryl Irene
2006 *Final Report, Historical Resource Impact Assessment, Enermark 4-3-33-21-W4M to 7-3-33-21-W4M Pipeline Right of Way (ASA Permit 2006-011).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Froese, Patricia
1984 *The Miry Creek Site (EeOc-5): Visitors From the Missisoury River?* Paper Presented at the Saskatchewan Archaeological Society Annual General Meeting, March 17, 1984.

Gibbon, Guy
1994 Cultures of the Upper Mississippi River Valley and Adjacent Prairies in Iowa and Minnesota. In *Plains Indians, A.D. 500-1500*. Karl H. Schlesier, ed. Pg. 128-148.

Gibson, Terrance H. and Christie Grekul
2010 *Final Report, Excavation of a Campsite Living Floor at PL1 in the Bodo Archaeological Locality (ASA Permit 2001-284).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Gifford, James C.
1960 The Type-Variety Method of Ceramic Classification as an Indicator of Cultural Phenomena. *American Antiquity* 25(3):341-347.

Gilmore, M. R.
1925 *Arikara Uses of Clay and Other Earth Products*. Indian Notes, Heye Foundation 2:283-289.

Goldsmith, A. Sean
2003 *Final Report, Historical Resource Impact Assessment, Alberta Transportation Deadfish Dam Rehabilitation (ASA Permit 2002-201).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Goldsmith, A. Sean, Matt Moors, Chris Green, and Thayer V. Head
2005 *Final Report, Historical Resource Impact Mitigation, Alberta Transportation Deadfish Dam Rehabilitation Project, (ASA Permit 2003-100).* Vol. 1. Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Green, D'Arcy
1993 The Tipperary Creek Pot: Thick, Chunky Pottery from South Central Saskatchewan. *Saskatchewan Archaeology: Journal of the Saskatchewan Archaeological Society* 14:15-26.

Grekul, Christie
2012 *2011 Public Excavation Project at FaOm-1 (ASA Permit 2011-060).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Griffin, James B.
1965 Appendix: Prehistoric Pottery from Southeastern Alberta. In *An Introduction to the Archaeology of Alberta*. H. M. Wormington and Richard G. Forbis, authors. Pg 209-248. Denver Museum of Natural History. Denver, Colorado.

Gryba, Eugene M.
1984 *Historical Resources Impact Assessment of the Little Bow River Crossing Near Carmangay (ASA Permit 1984-004).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Hanna, Margaret G.
1986 A Technological and Mineralogical Assessment of Some Head-Smashed-In Ceramics. In *Final Report of the 1984 Season at Head-Smached-In Buffalo Jump*. J.W. Brink, M. Wright, B. Dawe, and D. Glaum, eds. Archaeology Survey of Alberta, Manuscript Series, No 9.

Harty, Jennifer L.
2005 An Examination of Late Plains Period Occupations as Seen From FbPn-1. Master's Thesis. Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.

Head, Thomas
1994 *Final Report, Historical Resources Impact Assessment and Monitoring, NPS 42 Western Alberta System Mainline Upgrade and Loop, (ASA Permit 1993-010).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

1997 *Historical Resources Impact Assessment Beddington Trail N.W. from Hidden Valley Link N.W. to Simons Valley Road: Final Report (ASA Permit 1997-010).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

1998 *Final Report, Historical Resources Impact Assessment, Hopewell Residential Communities, NE quarter of 30-25-1-W5M (ASA Permit 1998-116).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

1999 *Final Report, Historical Resources Impact Mitigation, Hunter Valley (EiPp-16) and EiPp-18, (ASA Permit 1995-027).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Henrickson, E. F. and M. M. A. McDonald
1983 Ceramic Form and Function: An Ethnographic Search and an Archaeological Application. *American Anthropologist* 85(3):630-643.

Herron, M. K.
1986 A Formal and Functional Analysis of St. Johns Series Pottery from Two Sites in St. Augustine, Florida. In *Papers in Ceramic Analysis*. P.M. Rice, ed. Ceramic Notes 3. Pp. 31-45.

Hill, J. N., and R. K. Evans
1972 A Model for Classification and Typology. In *Models in Archaeology*. D.L. Clarke, ed. Pp. 231-273. Methuen, London.

Hudecek, Caroline R.
1989 *Avonlea/Old Women's: A Study of Culture Change on the Northern Plains Through the Analysis of Lithic and Ceramic Assemblages.* Master's thesis. Department of Anthropology, University of Alberta, Edmonton.

Johnson, Ann M.
1975 A Pottery Vessel from the Pouliot Site (24GL1002). *Archaeology in Montana* 16(2/3):63-72.

1988 Parallel Grooved Ceramics: An Addition to Avonlea Material Culture. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. L.B. Davis, ed. Pp. 137-143. Saskatchewan Archaeological Society. Saskatoon, Saskatchewan.

Joyes, Dennis C., Tom Jerde, and Doug Smith
2007 After Avonlea: The Twitchell Site in Northeastern Montana Prehistory. *Archaeology in Montana*. Vol 48, No.2:45-71

Kehoe, Alice B.
1959 Ceramic Affiliations in the Northwestern Plains. *American Antiquity* Vol. 25(2):237-246.

Kehoe, Thomas F.
1966 The Small Side-Notched Point System of the Northern Plains. *American Antiquity* 31(6):827-841.

1973 *The Gull Lake Site: A Prehistoric Bison Drive Site in Southwestern Saskatchewan.* Publications in Anthropology and History No. 1. Milwaukee Public Museum, Wisconsin.

Kehoe, Thomas F., and Alice Kehoe
1968 *Saskatchewan In The Northwestern Plains: A Symposium.* W.W. Caldwell and S.W. Conner, eds. Pp. 21-35. Occasional Paper No 1. The Center for Indian Studies Rocky Mountain College, Billings, Montana.

Keyser, James D.
1979 Late Prehistoric Period Bison Procurement on the Milk River in North-Central Montana. *Archaeology in Montana* 20(1).

Keyser, James D., and W.J. Byrne
1980 Fresno Reservoir Pottery: Saskatchewan Basin Ceramics in Northern Montana [with Comment]. *Canadian Archaeological Association* (4):1-25.

King, D.
1961 Rumsey Cairn field notes on file with Glenbow-Alberta Institute Public Archives, Calgary.

Kooyman, Brian P.
1990 *Final Report of the 1989 Excavation in the North Kill at Head-Smashed-In Buffalo Jump (DkPj-1) (ASA Permit 89-053*). Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Landals, Alison
1990 *1989 Oldman River Dam Prehistoric Archaeology Mitigation Program, Kill Sites Component (ASA Permit 1989-032)* Vol I. Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton

Linnamae, Urve
1988 The Tschtter Site: a Prehistoric Bison Pound in the Parklands. In *Out of the Past: Sites, Digs, and Artifacts in the Saskatoon Area*. Pp. 91-115. U. Linnamae and TEH Jones. Saskatoon Archaeological Society, Saskatoon.

Loveseth, Bea
1982 *Interim Report, EhPm-24 (Area D), 1981 Comparative Archaeological Conservation Studies (ASA Permits 81-113 and 81-155).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

MacNeish, Richard S.
1958 An Introduction to the Archaeology of Southeast Manitoba. National Museum of Canada, Bulletin 157. Ottawa.

Malainey, Mary Evelyn
1991 Internal and External Relationships of Saskatchewan Plains Pottery Assemblages: Circa A.D. 1300 to Contact. Unpublished Master's thesis. Department of Anthropology and Archaeology, University of Saskatoon.

Mann, Elizabeth H.
2007 Preliminary Evaluation of Precontact Pottery Recovered from the University of Alberta Field School near Bodo, East-Central Alberta. Paper presented at the 2007 meeting of the Canadian Archaeological Association, St. John's, Newfoundland.

2009 *Final Report, University of Alberta Field School, 2002, at FaOm-1, the Bodo Bison Skulls Site (ASA Permit 2002-113).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Meyer, David
1988 The Old Woman's Phase of the Saskatchewan Plains: Some Ideas. In *Archaeology in Alberta 1987.* M. Magne, ed. Pp. 55-63, Vol. Occational Paper No. 32. Archaeological Survey of Alberta. Edmonton.

Meyer, David, and Henry T. Epp
1990 North-South Interaction in the Late Prehistory of Central Saskatchewan. *Plains Anthropologist* 35:321-342.

Meyer, David and Scott Hamilton
1994 Neighbors to the North: Peoples of the Boreal Forest. In *Plains Indians, A.D. 500-1500*. Karl H. Schlesier, ed. Pg. 96-127.

Meyer, David, and Dale Walde
2009 Rethinking Avonlea: Pottery Wares and Cultural Phases. *Plains Anthropologist* 54(209):49-73.

Millar, J.F.V., H. Epp, T.W. Foster, J.S. Wilson, and G. Adams
1972 The Southwestern Saskatchewan Archaeological Project. *Na'Pao* 2(2):3-39.

Milne Brumley, Laurie
1978 *The Saamis Site: A Late Prehistoric-Protohistoric Campsite in Medicine Hat, Alberta*. National Museum of Man Mercury Series No. 79. Archeological Survey of Canada, Ottawa.

Morgan, Grace R.
1979 *An Ecological Study of the Northern Plains As Seen Through the Garratt Site.* Department of Anthropology Occasional Paper 1, University of Regina, Regina.

Morlan, Richard E.
n.d. Canadian Archaeological Radiocarbon Database. Record on file, Canadian Museum of Civilization, Gatineau, Québec.

Nicholson, B. A., Lorie Mokelki, and Sylvia Nicholson
2010 Vickers, Mortlach, Moose Jaw Culture, Sacttered Village – Who Were They and How Did They Get Here? *Manitoba Archaeological Journal* Vol. 16 (1 and 2), 23-47.

Paquin, Todd Antoine
1995 *Pottery Styles as Indicators of Cultural Patterns: The Kisis Complex.* Unpublished Master's thesis. Department of Anthropology and Archaeology, University of Saskatoon.

Peach, Kate, Jeremy Leyden, Bonnie Brenner, and Tracy Hydeman
2006 *Historical Resources Mitigation, Alberta Transportation, Stoney Trail Expansion Component A, Stage I Mitigation of Sites EgPn-667 and EhPm 85; Stage I and II Mitigation of Site EgPm-82, Final Report (ASA Permit 2004-184).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Peck, Trever R.
1996 *Late Side-notched Projectil Points on the Northwestern Plains*. Master's Thesis: Department of Anthropology, University of Alberta, Edmonton.

2011 Archaeological Evidence for Native Lifeways on the Northern Plains. AU Press, Athabasca University. Edmonton

Peck, Trevor R., and John W. Ives
2001 Late Side-Notched Projectile Points in the Northern Plains. *Plains Anthropologist* 46(176):163-193.

Prentice, Jean
1983 *The Tschetter Site: A Study of a Late Prehistoric Bison Kill*. Unpublished Master's thesis. Department of Anthropology and Archaeology, University of Saskatoon.

Quigg, Michael J.
1988 A New Avonlea Ceramic Style from North-Central Montana. In *Avonlea Yesterday and Today: Archaeology and Prehistory*. L.B. Davis, ed. Pp. 145-153. Saskatchewan Archaeological Society. Saskatoon, Saskatchewan.

Reeves, Brian O. K.
1978 Head-Smashed-In: 5500 Years of Bison Jumping in the Alberta Plains. *Plains Anthropologist* Memoir 14, 23(82) pt.2:151-174.

1983a *Culture change in the northern plains, 1000 B.C.-A.D. 1000*. Archaeological Survey of Alberta. Edmonton.

1983b The Kenney Site: A Stratified Campsite in Southwestern Alberta. *Archaeology in Montana* 24(1):1-135

1987 *Oldman River Dam Phase II Archaeological and Historical Resources Inventory and Assessment, Volume II, Prehistoric Sites (ASA Permit 1985-047).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Reeves, Brian, Bea Loveseth, and Veronica Maltin
1981 *Final Report, 1980 Field Investigations, DkPi-2 Fort Macleod (ASA Permit 1980-053).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Rice, Prudence M.
1987 *Pottery Analysis: A Sourcebook*. University of Chicago Press. Chicago, USA

Ritchie, W. A.
1944 The Pre-Iroquian Occupations of New York State. Rochester, NY, Rochester Museum of Arts and Sciences Memoir, no. 1

Ritchie, William A., and Richard S. MacNeish
1949 The Pre-Iroquoian Pottery of New York State. *American Antiquity*. Vol 15 No 2: 97-124.

Rogers, James L. and Joachim A. Fromhold
1975 *The FM Ranch Site, Preliminary Report (ASA Permit 1974-025).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Rouse, Irving, B.
1939 Prehistory in Haiti: A Study in Method. New Haven, CT, Yale University Publications in Anthropology no. 21

1960 The classification of artifacts in archaeology. *American Antiquity*. Pg: 313-323.

1972 *Introduction to Prehistory*. McGraw-Hill Book Company. New York.

Rye, O. S.
1981 *Pottery Technology: Principles and Reconstruction*. Taraxacum.

Sackett, James R.
1977 The meaning of Style in Archaeology: A General Model. *American Antiquity* 42(3):369-380.

1985 Style and Ethnicity in the Kalahari: A Reply to Wiessner. *American Antiquity* 50(1):154-159.

Saylor, S. G.
1985 *Mitigative Studies, Home Oil Company Limited, Manyberries Pipeline, Sites DgPa-3, DgPa-4, DiOw-6, and DhOx-16 (ASA Permit 84-084).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Shepard, Anna O.
1956 *Ceramics for the Archaeologist*. Carnegie Institute of Washington. Wasington, D. C.

Simon, Arleyn
1979 Pottery Manufacture Analysis: Experimental Assessment of Technological Continuity in the Altamont Region. *Archaeology in Montana* 20(2):1-78.

Sinopoli, Carla M.
1991 Approaches to Archaeological Ceramics. Springer US.

Spaulding, Albert C.
1953 Statistical Tecniques for the Discovery of Artifact Types. *American Antiquity* 18:305-313.

1954 Reply to Ford. *American Antiquity* 19(4):391-393.

St. Cyr, Bob
1993 The Piche Pot From Ponteix: An Old Women's Phase Vessel. Saskatchewan Archaeology: The Journal of the Saskatchewan Archaeological Society, Vol 14:27-33.

Steinhauser, Bob
1990 Appendix III, Ceramic Analysis, DjPm-126. In *1989 Oldman River Dam Prehistoric Archaeology Mitigation Program, Kill Sites Component, Vol I (ASA Permit 1989-032).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Sutton, Mark Q. and Brooke S. Arkush
2006 *Archaeological Laboratory Methods: An Introduction*. Kendall Hunt Publishing Co.

Syms, E. Leigh
1977 Cultural Ecology and Ecological Dynamics of the Ceramic Period in Southwestern Manitoba Memoir 12, *Plains Anthropologist* 22(76, Part 2):1-160.

Unfreed, Wendy J. and Stanley Van Dyke
2005 *Archaeological Investigations at the Junction Site (DkPi-2).* Occasional Papers of the Archaeological Society of Alberta No. 4.

Terrell, John Edward
2001 Archaeology, Material Culture, and the Complementary Forms of Social Life. In *Fleeting Identities: Perishable Material Culture in Archaeological Research*. Penelope Ballard Drooker, ed. Pp. 58-75. Center for Archaeological Investigations, No 28. Southern Illinois University Carbondale.

Trigger, Bruce G.
2006 *A History of Archaeological Thought*. Cambridge University Press. New York

Turney, Michael
2005 *Final Report, Historical Resource Impact Assessment, Enermark et al. Trochu 7-3-33-21-W4M (ASA Permit 2004-456).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

Vickers, J. Roderick

1982 *Final Report,1980 Archaeological Investigations at the FM Ranch Site, EfPk-1 (ASA Permit 1980-167).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

1983 *Final Report, Historical Resources Impact Assessment, Temporary Interpretation Facility at Head-Smashed-In Campsite DkPj-2 (ASA Permit 1982).* Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

1986 *Alberta Plains Prehistory: A Review*. Occasional Paper No. 27. Archaeological Survey of Alberta. Edmonton, Alberta

1989 *The Ross Site (DlPd-3), 1980 Research*. Archaeological Survey of Alberta. Manuscript Series No. 14.

Walde, Dale

1999 Appendix 2: The Ceramic Assemblage from the Hunter Valley Site (EiPp-16). In *Final Report, Historical Resources Impact Mitigation, Hunter Valley (EiPp-16) and EiPp-18, (ASA Permit 1995-027).* Pp 216-237. Archaeological Survey of Alberta. Copies available from Archaeological Survey of Alberta, Edmonton.

2003 *The Mortlach Phase*. Archaeological Society of Alberta. Calgary, AB

2004 Mortlach and One-Gun: Phase to Phase. In *Archaeology on the Edge: New Perspectives from the Northern Plains*. B. Kooyman and J. Kelly, eds. University of Calgary Press. Calgary, Alberta.

2005 Appendix IV: A descriptive Assessment of Pottery at DkPi-2. In *Archaeological Investigations at the Junction Site (DkPi-2).* Occasional Papers of the Archaeological Society of Alberta No. 4.

2006a *A Descriptive Assessment of Little Bow Ceramic Assemblages*. Report available from the author.

2006b Avonlea and Athabaskan Migrations: A Reconsideration. *Plains Anthropologist* 51(198):185-197.

2006c Sedentism and pre-contact tribal organization on the northern plains: colonial imposition or indigenous development? *World Archaeology* 38(2):291-310.

Walde, Dale, and David Meyer

2003 Pre-Contact Pottery in Alberta: An Overview. In *Archaeology in Alberta: A View from the New Millennium*. J.W. Brink and J. F. Dormaar, eds. Pp. 132-152. Archaeological Society of Alberta. Medicine Hat, Alberta.

Walde, Dale, David Meyer, and Wendy Unfreed

1995 The Late Period on the Canadian and Adjacent Plains. *Revista de Arqueologia Americana* (No. 9):7-9, 11-66.

Walde, Dale, David Meyer, and Patrick Young
2010[2006] Precontact Pottery in Alberta: An Overview. *Manitoba Archaeological Journal* Vol. 16 (1 and 2), 139-165.

Walker, Ernest G.
1978 *Faunal Remains from the Tschetter Site (FbNr-1*). Manuscript on file, Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.

1983 Archaeological Resource Assessment: The Tipperary Creek Project. Report available at the Meewasin Valley Authority, Saskatoon.

Walker, Ernest G., Richard E. Morlan, and Leslie J. Amundson
1987 *Archaeological Field Investigations at the Wanuskewin Heritage Park, 1986 Field Season Interim Report (Permit 1986-049).* Copies available from Saskatchewan Parks, Recreation, and Culture, Regina.

Wedel, Waldo R.
1951 Notes on Aboriginal Pottery from Montana. *Journal of the Washington Academy of Sciences* 41(4):130-8.

Wettlaufer, Boyd
1951 An Archaeological Survey of Saskatchewan. No. 1. Manuscript on file at the Royal Saskatchewan Museum, Saskatoon.

1955 *The Mortlach Site in the Besant Valley of Central Saskatchewan*. Anthropological Series No 1. Department of Natural Resources, Regina, Saskatchewan

Whatley, Kevin
2004 *The Analysis of the Sherwin Campbell Site (EgOa-5): An Old Women's Phase Site of Southwest Saskatchewan*. Master's thesis. Department of Archaeology, University of Saskatchewan.

Wheat, J. B., James C. Gifford, and William W. Wasley
Ceramic Variety, Type Cluster, and Ceramic System in Southwestern Pottery Analysis. *American Antiquity* Pg. 34-47.

Wiessner, Polly
1983 Style and Social Information in Kalahari San Projectile Points. *American Antiquity* 48(2):253-276.

1985 Style or Isochrestic Variation? A Reply to Sackett. *American Antiquity* 50(1):160-166.

Willey, G. R., and P Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press. Chicago, IL

Wilson, James S.
1984 The Lucky Strike Site: A Late Prehistoric Campsite in the Aspen Parkland. *Saskatchewan Archaeology* 5:5-26.

Wormington, H. Marie and Richard Forbis
1965 *An Introduction to the Archaeology of Alberta, Canada*. Denver Museum of Natural History. Denver, Colorado

Young, Patrick S.
2006 *An Analysis of Late Woodland Ceramics From Peter Pond Lake, Saskatchewan*. Master's thesis. Department of Archaeology, University of Saskatchewan.

APPENDIX A: Additional Vessel Data

Table 82: Surface finish, temper, paste, hardness, and residue characteristics.

Table 83: Metric data for vessel forms.

Table 84: Metric data for decorative elements.

Appendix Abbreviations:

VCR	Vertical cord-roughened	CWT	Cord-wrapped tool
GCR	General cord-roughened	Impr.	Impression
R	Roughened	Lt	Light
Sm	Smoothed	M	Medium
D	Dimpled	PO	Partially obliterated
TI	Textile impressed	CO	Completely obliterated
St	Stamped	L	Laminated
KCI	Knotted cord impressed	Bl	Blocky
Br	Brushed	C	Compact
FI	Finger Impressed		

Table 82: Surface finish, temper, paste, hardness, and residue characteristics.

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Antelope Creek	5	VCR		PO				4.6		L		Yes
Antelope Creek	6	VCR		PO				2.0		L		
Antelope Creek	7	VCR						3.9		L		
Antelope Creek	8	R						4.8		L		Yes
Antelope Creek	9	VCR		PO				7.2		Bl		Yes
Antelope Creek	10	R						2.3		L-Bl		Yes
Antelope Creek	11	TI		PO				6.1		L		
Antelope Creek	12	VCR										
Antelope Creek	13	N/A					Sand	1.9		L		
Antelope Creek	14	VCR		PO				2.3		Bl		
Antelope Creek	15	TI						4.6		C		
Antelope Creek	16	VCR		PO				4.6		C		Yes
Antelope Creek	17	R						3.3		C		
Antelope Creek	18	VCR						3.2		B-L		
Antelope Creek	19	VCR		PO			Sand	4.7				
Antelope Creek	20	VCR						5.3		Bl-L		
Antelope Creek	21	VCR		PO			Sand	2.8		Bl		Yes
Antelope Creek	22	VCR		PO				6.3		Bl-L		
Antelope Creek	23	VCR		PO				4.9		Bl		Yes
Antelope Creek	24	VCR		PO				7.4		Bl-L		Yes
Antelope Creek	25	R						3.4		Bl		Yes
Antelope Creek	26	VCR		PO			Sand	2.3		Bl-L		
Antelope Creek	27	N/A						2.1		Bl-L		
Antelope Creek	28	VCR		PO				3.6		Bl		
Antelope Creek	29	N/A					Sand	1.0		Bl		
Antelope Creek	38	VCR		PO	2.0	2.0		3.5		L		No
Blakiston	1	VCR	Z	Lt	1.4	2.0	Granite	2.8	15	L	3.0	Some
Blakiston	2	VCR	N/A	Lt	1.2	1.6	Granite	2.4	15	L-C	3.5	Some
Blakiston	3	R		Lt	3.9	2.4	Granite	31.0	7	Bl-L	3.5	Unclear
Blakiston	4	R		Lt	3.0	3.6	Granite	2.4	10	Bl-L	3.5	No
Blakiston	5	D		PO								
Blakiston	6	VCR	N/A	PO	2.2	2.8	Granite	2.5	10	Bl-L	3.5	Yes

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Blakiston	7	GCR	Z	PO	1.8	1.9	Granite	2.3	10	L-Bl	3.5	No
Bodo Bison Skulls	1	VCR	N/A	PO	1.4	1.1	Granite	2.5	5	C-L	3.0	No
Bodo Bison Skulls	2	VCR	S	PO	1.5	1.1	Granite	3.2	7	L-Bl	4.0	Some
Bodo Bison Skulls	3	R					Granite	2.3	7	L	3.5	Unclear
Bodo Bison Skulls	5	R		PO			Granite	4.0	10	L	3.5	No
Bodo Bison Skulls	6	VCR	Z	PO	1.7	1.0	Granite	4.2	7	C-L	4.0	No
Bodo Bison Skulls	8	R		PO			Granite	2.2	7	L-Bl	4.0	No
Bodo Bison Skulls	9	VCR	N/A	PO			Granite	4.6	10	L-Bl	4.0	No
Bodo Bison Skulls	10	VCR	N/A	PO	1.1	2.5	Granite	2.8	10	Bl-L	4.0	No
Bodo Bison Skulls	11	GCR	N/A	PO	1.6	1.9	Granite	2.7	5	L	3.5	No
Bodo Bison Skulls	12	N/A					Granite	4.6	7	L	4.0	No
Bodo Bison Skulls	13	VCR	N/A	PO			Granite	3.9	10	L	3.5	No
Bodo Bison Skulls	14	N/A					Granite	1.1	7	L	4.0	Unclear
Bodo Bison Skulls	15	VCR	Z	PO	2.2	2.0	Granite	2.6	7	Bl-C	4.0	Some
Bodo Bison Skulls	17	D		M	2.0		Granite	4.7	10	L	3.5	No
Bodo Overlook	1	N/A					Granite	2.1	5	L-Bl	3.0	Some
Bodo Overlook	2	N/A					Granite	2.0	5	L-Bl	3.0	No
Bodo Overlook	3	Sm		CO			Granite	1.8	7	L	2.5	No
Bodo Overlook	4	VCR	N/A	PO	1.5	1.4	Granite	2.7	5	L-Bl	3.5	Yes
Bodo Overlook	5	Sm		PO			Granite	4.7	7	B-L	4.0	No
Bridgewater	1	VCR	N/A	PO	2.0	2.2	Granite	4.0	5	L-Bl	3.0	Some
Bridgewater	2	VCR	Z	PO	1.0	1.3	Granite	2.0	4	L-C	3.5	Yes
British Block	1	VCR	Z	PO	1.2	2.8	Granite	3.8	5	L-Bl	3.5	No

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
British Block	2	Sm		CO			Granite	3.0	7	B-L	3.0	No
Cache	1	Sm		PO			Quartzite	2.0		L	3.5	Yes
Cache	2	VCR	S	PO	2.5	2.0	Quartzite	3.0		Bl-C	3.5	Unclear
Castleforks Buffalo Jump	1	Sm		PO			Granite	3.0	7	Bl-L	3.0	some
Castleforks Buffalo Jump	2	VCR	N/A	Lt	1.2	1.3	Granite	2.3	7	L	3.0	Yes
Castleforks Buffalo Jump	3	VCR		PO	1.8	1.8	Granite	3.0	7	L	3.0	No
Castleforks Buffalo Jump	4	GCR	N/A	PO	2.0	1.5	Granite	3.4	7	L-Bl	3.0	Yes
Castleforks Buffalo Jump	5	VCR	N/A	PO	1.0	1.5	Granite	2.4	5	L	3.0	Yes
Corey Ranch	1	Sm		CO			Quartzite	5.5	27	Bl-L		Yes
DgPa-3	1	VCR									3.0	Yes
DgPa-3	2	Sm		CO								No
DgPa-3	3	N/A										
DgPa-3	4	N/A										No
DgPa-4	1	VCR	N/A	PO	2.5	2.0	Granite	3.5	5	L-Bl	2.5	Yes
DgPa-4	2	VCR		PO	2.6	1.5						
Dundurn	1	VCR	Z	PO	2.4	2.1	Quartzite	7.7	3	L	3.5	No
Dundurn	2	VCR		PO	1.4	2.0	Granite	4.8	7	L-Bl	3.5	Yes
EbPi-51	2	R		PO						Bl		Yes
EbPi-51	3	R		PO						Bl-L		Yes
EbPi-52	2	VCR			1.5	2.0						Yes
EbPi-57	1	VCR		PO								
EbPi-57	2	VCR		PO								Yes
EbPi-57	3	VCR			1.4	3.5						
EbPi-63	1	Sm		CO								Yes
EbPi-63	2	VCR		PO								
EbPi-67	1	N/A										
EbPi-67	2	R		PO								
EbPi-67	4	Sm		CO								
EbPi-73	1	Sm		CO								
EbPi-73	2	R										

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
EbPi-73	4	GCR		PO								Yes
EbPi-73	5	R		PO								
EbPi-73	6	R										
EbPi-73	7	Sm		CO								
EbPi-73	8	R										
EbPi-73	13	GCR		PO						Bl-L		Yes
EbPi-73	15	VCR										
EbPi-73	16	Sm		CO								
EbPi-73	17	VCR		PO						Bl		Yes
EfOw-26	1	VCR	N/A	Lt	1.6	2.2	Granite	6.3	10	Bl-C	4.0	No
EfOw-26	2	N/A					Granite	2.1	3	C-Bl	4.0	No
EgPm-82	1	N/A										
EkPf-38	1	D		PO	3.5	3.4	Granite	2.6	7	Bl-L	3.5	Yes
Ethridge	1	D		PO			Granite				4.0	Yes
Ethridge	2	GCR		PO			Granite				4.0	Yes
FM Ranch Campsite	1	N/A	N/A	PO			Granite	3.7	5	Bl-L	3.0	Yes
FM Ranch Campsite	7	Sm		CO			Granite	2.0	10	Bl-L	3.5	No
FM Ranch Campsite	8	GCR	Z	Deep			Granite	2.2	6	L-Bl	3.5	Yes
Fresno	1	Sm		CO			Quartzite	4.0		Bl-C	3.0	Yes
Fresno	2	St		PO			Quartzite	2.0		C	4.0	
Fresno	3	VCR		PO		2.0	Quartzite	4.0		L	2.5	Yes
Fresno	4	GCR	S	PO	2.5	2.5	Quartzite	5.0		L	3.0	Yes
Fresno	5	N/A					Quartzite	3.0			4.0	No
Fresno	6	GCR	S	PO			Quartzite	1.0		C	3.5	
Garratt Site	1	VCR	Z	PO	1.5	2.0	Feldspar	3.0	5	C-L	3.5	No
Garratt Site	4	TI		PO	0.8	1.4	Granite	0.7	3	L	3.0	No
Garratt Site	5	VCR	N/A	PO	1.4	1.3	Granite	3.6	7	L-Bl	3.5	No
Garratt Site	6	TI		M	1.4	1.4	Granite	2.3	5	Bl-L	3.5	No
Garratt Site	7	R		PO			Feldspar	1.9	5	Bl-L	3.5	No
Garratt Site	8	R		PO			Feldspar	2.5	7	Bl-L	3.5	No
Garratt Site	9	TI		PO			Feldspar	3.2	7	Bl-L	4.0	No

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Garratt Site	11	VCR	N/A	PO	1.5	1.7	Granite	4.7	5	L-Bl	3.0	No
Garratt Site	12	VCR	Z	PO	1.2	1.4	Feldspar	2.2	7	L-C	3.0	Unclear
Garratt Site	13	TI	Z	PO	2.0	2.3	Granite	2.9	7	L-Bl	3.5	No
Garratt Site	14	TI		PO	0.8	2.8	Granite	2.8	5	L-Bl	3.0	No
Garratt Site	16	VCR	Z	PO	1.2	1.4	Feldspar	1.5	7	L	2.5	No
Grassy Lake Cairn	1	R		PO			Granite	5.8	7	L-Bl	3.5	Yes
Grassy Lake Cairn	2	R		PO			Granite	3.6	10	L	3.5	No
Grassy Lake Cairn	3	R					Granite	1.0	5	L-C	3.0	No
Gull Lake	1	VCR	N/A	PO	1.0	1.9	Granite	2.3	10	C-Bl	3.5	No
Gull Lake	2	VCR	Z	PO	1.2	1.3	Feldspar	1.6	3	L-Bl	4.5	Yes
Gull Lake	3	VCR	N/A	PO	2.0	2.6	Feldspar	4.0	10	L-C	4.0	No
Gull Lake	4	VCR	N/A	Lt	1.4	1.7	Feldspar	1.8	7	Bl-C	3.0	No
Gull Lake	5	VCR	N/A	PO	1.7	2.2	Feldspar	6.7	15	Bl	3.5	No
Gull Lake	6	VCR	Z	M	1.3	2.7	Feldspar	3.7	5	L-C	3.5	No
Gull Lake	7	R		PO			Feldspar	3.5	10	C-Bl	3.5	No
Gull Lake	8	R		M	1.6	2.5	Feldspar	3.4	7	Bl	4.5	No
Gull Lake	9	VCR	Z	PO	1.6	2.1	Granite	3.9	7	Bl-L	3.5	Yes
Gull Lake	10	TI		PO	1.5	1.5	Granite	3.7	7	Bl-L	3.5	No
Gull Lake	12	VCR		PO	3.0	3.0						
Head-Smashed-In	1	Br		PO	0.8	1.1	Granite	4.9	5	L-C	3.5	Some
Head-Smashed-In	2	VCR	N/A	PO	1.6	2.0	Granite	3.9	5	L-Bl	3.0	Yes
Head-Smashed-In	3	N/A					Granite	4.5	7	C-Bl	3.0	No
Head-Smashed-In	4	Sm		CO			Granite	3.3	7	L-Bl	3.0	Yes
Head-Smashed-In	5	Sm		PO			Feldspar	3.2	7	L-Bl	3.5	No
Hunter Valley	1	VCR	N/A	M		1.4	Granite	1.8	5	L	3.0	No
Hunter Valley	2	GCR	Z	M	1.7	1.1	Granite	2.4	7	Bl	3.0	No
Hunter Valley	3	VCR	Z	PO	3.0	3.1	Granite	3.3	5	Bl	3.5	Some

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Hunter Valley	4	VCR		PO	2.0	2.4	Granite	3.8	7	B-L	3.0	No
Junction	1	VCR	Z	PO	1.0	0.7	Granite	2.6	7	L-Bl	3.5	Yes
Junction	2	Sm		CO			Feldspar	6.6	7	L-Bl	4.0	No
Junction	3	Sm		CO			Feldspar	3.5	7	Bl-L	3.5	Yes
Junction	4	St		Lt			Granite	3.8	5	L-Bl	2.5	Minimal
Junction	5	R					Granite	3.9	5	L-Bl	3.0	No
Junction	6	VCR	N/A	PO	1.5	1.2	Feldspar	2.9	7	L-Bl	2.5	No
Junction	7	GCR	N/A	PO	1.5	1.1	Granite	4.0	7	Bl	4.0	Yes
Junction	8	GCR	S	PO	1.7	1.8	Granite	3.2	7	L-Bl	3.0	Yes
Junction	9	R		PO			Granite	7.5	7	L-C	2.5	No
Junction	11	R		PO			Granite	3.4	10	Bl-L	3.0	No
Junction	12	N/A					Granite	3.0	7	L-Bl	3.0	No
Junction	13	Sm		CO			Feldspar	4.2	7	L-Bl	3.5	Yes
Junction	14	R					Granite	3.7	7	L-Bl	2.5	Some
Junction	15	R					Granite	5.3	10	L-Bl	3.5	Some
Junction	16	R		PO			Granite	3.6	10	L-Bl	4.0	Yes
Junction	18	GCR		PO			Granite	6.1	7	Bl-L	3.0	No
Junction	19	GCR		PO	2.4	1.5	Granite	3.3	5	Bl-L	3.0	Yes
Junction	20	N/A					Granite	2.4	7	L-Bl	2.0	Yes
Junction	23	Sm		CO			Feldspar	3.8	6	Bl-L	3.0	No
Junction	24	N/A		PO			Feldspar	2.4	7	L-Bl	3.5	
Junction	27	Sm		CO			Granite	3.9	10	L-Bl	3.5	No
Junction	28	R		PO			Granite	3.8	7	L-Bl	2.5	Yes
Junction	29	R		PO			Granite	4.4	10	L-C	4.0	No
Kenny	1	VCR	N/A	PO	1.2	1.7	Granite	2.8	5	L-C	3.5	Minimal
Little Bow	1	Sm		CO			Granite	2.1	7	Bl-C	3.0	Some
Little Bow	2	N/A					Granite	3.6	7	Bl	3.5	Yes
Little Bow	3	Sm		CO			Granite	3.0				
Little Bow	4	Sm		CO			Granite	2.3	10	L-C	3.0	No
Little Bow	5	VCR	N/A	PO	1.4	1.5	Granite	1.4	10	L-Bl	3.0	No
Little Bow	6	VCR		PO			Granite	3.0				
Little Bow	7	VCR	N/A	M	1.3	3.8	Granite	1.7	7	Bl-L	3.5	Yes
Little Bow	8	N/A					Mica	3.0				
Little Bow	9	VCR	N/A	PO	2.1	2.4	Granite	2.9	10	L-Bl	2.5	Yes

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Little Bow	10	VCR	N/A	Deep	2.3	4.1	Granite	4.4	7	Bl-L	3.5	No
Little Bow	11	Sm		CO			Granite	2.6	7	Bl	4.0	Yes
Little Bow	12	N/A						3.0				
Miry Creek	1	VCR						3.5		Bl-L		Yes
Miry Creek	2	VCR						2.9		Bl		
Miry Creek	3	Sm		PO			Sand	4.9				
Miry Creek	4	Sm		CO				2.5		L		
Miry Creek	5	VCR		PO				4.0		Bl-L		Yes
Miry Creek	6	GCR					Sand	1.0		Bl		Yes
Miry Creek	7	N/A						5.3		L		
Miry Creek	8	VCR		PO				3.6		Bl-L		Yes
Miry Creek	9	VCR		PO				4.5		Bl-L		Yes
Miry Creek	10	N/A						5.6		Bl		
Miry Creek	11	N/A						4.0		L		
Miry Creek	12	VCR						1.5		Bl		
Miry Creek	13	Sm		CO				4.0		L		
Miry Creek	14	VCR		PO				3.4		Bl		
Miry Creek	15	R		PO			Sand	3.0		L		
Miry Creek	16	N/A						3.0		Bl-L		
Miry Creek	17	VCR						5.3		L		
Miry Creek	18	VCR		PO	2.2	2.3		4.5		Bl-L		Yes
Miry Creek	19	Sm		CO				5.0		L		
Miry Creek	20	VCR						3.5		Bl		Yes
Miry Creek	21	N/A					Sand	1.0		Bl		
Miry Creek	22	N/A						2.7		Bl		
Miry Creek	23	VCR		PO				2.5		L		
Miry Creek	24	Sm		CO				2.0		L-Bl		Yes
Miry Creek	25	Sm		CO				2.6		Bl		
Miry Creek	26	VCR			1.7	5.0		3.9		Bl		Yes
Miry Creek	27	R						1.3		L		
Miry Creek	28	N/A						4.0		L		Yes
Miry Creek	29	VCR		PO			Sand	2.0		Bl		Yes
Miry Creek	30	VCR		PO				2.0		L		Yes
Morkin	1	Sm		CO			Granite	2.5	7	Bl	4.5	Yes

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Morkin	2	Sm		CO			Granite	2.2	10	Bl	4.0	No
Morkin	3	VCR	N/A	Lt	2.4	1.9	Granite	4.7	7	C-Bl	4.0	No
Morkin	4	Sm		CO			Granite	1.9	5	C-Bl	3.5	No
Morkin	5	GCR	N/A	PO	1.1	1.4	Granite	2.1	7	L-Bl	3.5	No
Morkin	6	GCR	N/A	Lt	1.6	1.2	Granite	1.4	7	L	4.0	No
Morkin	7	Sm		CO			Granite	3.1	5	C	4.0	No
Morkin	8	Sm		CO			Granite	2.6	7	Bl-C	3.5	No
Morkin	9	R		PO	1.9	2.3	Granite	2.8	3	L-C	4.0	No
Morkin	10	KCI	N/A	M	0.7	1.9	Granite	3.1	7	Bl	4.5	No
Morkin	11	Sm		CO			Granite	2.5	7	Bl-C	3.5	Yes
Morkin	12	R					Granite	2.1	5	C-Bl	3.5	Yes
Morkin	13	Sm		CO			Granite	1.8	10	Bl-C	4.0	No
Morkin	14	Sm		CO			Granite	2.9	10	Bl-C	3.5	Yes
Morkin	15	Br		M	1.8	0.7	Granite	1.4	7	Bl-L	4.0	No
Morkin	16	Br		M	0.7	0.8	Granite	1.8	10	Bl-C	4.0	No
Old Women's Buffalo Jump	1	VCR	N/A	PO	1.6	1.5	Granite	3.5	3	C-Bl	3.0	Yes
Piche Pot	1	VCR		PO			Granite					
Pouliot	1	VCR		PO		5.0	Granite	6.0		L	2.5	Yes
Ross	1	VCR	N/A	PO	1.5	4.0	Granite	5.3	10	L-Bl	4.0	Some
Ross	2	VCR	N/A	PO	2.0		Granite	4.9	10	L-Bl	4.0	No
Ross	3	VCR	N/A	PO	0.8	1.2	Granite	2.0	5	L	4.0	No
Ross	4	KCI		M	2.3	1.5	Granite	5.8	7	L-Bl	3.5	No
Ross	5	VCR	Z	PO	1.8	1.2	Granite	4.2	8	Bl-L	4.0	No
Ross	6	Sm		CO			Granite	2.3	5	Bl-L	4.0	Yes
Ross	7	VCR	N/A	PO	0.6	0.8	Granite	1.5	7	L-Bl	5.0	No
Ross	8	VCR	S	PO	2.0	1.8	Granite	4.4	7	L-Bl	5.5	Some
Ross	9	D		PO	2.7		Granite	2.9	7	L-C	3.5	No
Ross	10	D		PO	2.6		Granite	3.9	7	L	3.0	No
Ross	11	VCR	N/A	PO	1.3	2.0	Granite	2.8	7	L	3.5	Yes
Ross	12	VCR	Z	PO	1.2	2.7	Granite	4.2	7	L	3.5	Yes
Ross	13	Sm		CO			Granite	2.8	10	L-Bl	3.0	No
Ross	14	R	Z	PO			Granite	2.7	5	Bl-L	3.0	Yes
Ross	15	N/A					Granite	3.0	5	L-Bl	4.0	No

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Ross	16	R		M			Granite	2.6	7	L-Bl	4.0	No
Ross	17	VCR	N/A	PO	1.0	1.1	Granite	5.3	7	Bl-L	4.0	No
Rumsey Cairn	1	VCR	N/A	PO	0.6	1.0	Granite	2.0	5	Bl-L	4.0	No
Rumsey Cairn	2	D										
Saamis	1	St					Granite	2.0	5	C-L	3.0	
Saamis	2	VCR		Lt	1.5	1.5	Granite	0.1	5	C	3.0	Yes
Saamis	3	VCR	N/A	PO	2.0	3.0	Granite	2.0	10	Bl-L	3.5	Yes
Saamis	4	VCR	N/A	PO	2.0	3.0	Granite	2.0	10	Bl-L	3.5	Yes
Saamis	5	GCR	N/A	PO			Granite			Bl-C	3.5	
Saamis	6	GCR	N/A	PO								
Saamis	7	VCR	N/A	PO						Bl-L		
Saamis	8	R		PO			Granite	2.0	15	L	4.0	
Saamis	9	R		PO			Granite	2.0	15	L	4.0	
Saamis	10	R		PO			Granite	2.0	15	L	4.0	
Saamis	11	R		PO				2.0	15	L	4.0	
Saamis	12	Sm		CO			Granite	5.0	15	Bl		
Saamis	13	Sm		CO								
Saamis	14	Sm		CO			Granite	5.0	15	Bl		
Saamis	15	Sm		CO			Granite	5.0	15	Bl		
Saamis	16	Sm		CO			Granite	3.0	15	Bl-L	4.0	
Saamis	17	Sm		CO			Granite	3.0	15	Bl-L	4.0	
Saamis	18	N/A					Granite	1.0	5	C	4.0	
Saamis	19	FI		M			Granite	4.0	5	L-C	3.5	
Sherwin Campbell	1	R					Granite	2.7	5	L-C	3.5	No
Sherwin Campbell	2	VCR	N/A	PO	1.6	2.3	Granite	2.4	5	L-C	3.0	No
Sherwin Campbell	3	VCR	Z	PO	1.6	3.0	Granite	5.7	6	L-C	3.5	No
Sherwin Campbell	4	VCR		PO	0.9	1.1	Granite	4.1	5	L-C	3.0	Yes
Sherwin Campbell	5	TI		PO	2.3	1.5	Granite	5.2	7	L-Bl	3.0	Yes
Sherwin Campbell	6	KCI	S	PO	3.0	4.0	Granite	5.0	5	L-Bl	4.5	No

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Sherwin Campbell	7	VCR	N/A	PO	2.0	2.3	Granite	4.5	5	L-Bl	3.5	No
Sherwin Campbell	8	R		PO			Granite	5.1	5	L-Bl	3.5	Yes
Sherwin Campbell	9	VCR	Z	M	1.5	1.8	Granite	12.3	7	L-Bl	3.5	Unclear
Sherwin Campbell	10	R		Lt			Granite	6.6	7	L-Bl	3.0	No
Sherwin Campbell	11	R		PO			Granite	2.7	5	L-Bl	3.5	No
Sherwin Campbell	12	R					Granite	3.9	7	L	2.5	Yes
Sherwin Campbell	13	GCR		PO			Quartzite	7.3	5	L-Bl	3.5	No
Sherwin Campbell	14	VCR	N/A	PO	1.1	0.9	Granite	2.6	7	Bl	35.0	No
Sherwin Campbell	15	R		PO			Granite	4.0	7	L	3.0	Yes
Sherwin Campbell	16	VCR	N/A	PO	1.4	0.8		1.7	5	C-Bl	3.0	No
Sherwin Campbell	17	Sm		CO			Granite	1.0	2	L-C	3.5	No
Sherwin Campbell	18	GCR	N/A	PO	1.3	2.7	Granite	3.1	7	Bl-C	2.5	No
Sherwin Campbell	19	VCR	N/A	PO			Granite	1.9	5	Bl-L	3.5	Unclear
Sherwin Campbell	20	Sm		CO			Granite	5.3	7	L	3.5	Yes
Tipperary Creek	1	VCR	N/A	M	2.0	2.0	Granite	1.9	3	L-Bl	4.0	Yes
Trout Creek Campsite	1	VCR	N/A	PO	0.7	2.9	Granite	2.5	5	L-Bl	3.5	Some
Trout Creek Campsite	2	VCR	Z	Lt	2.6	2.7	Granite	2.4	5	C-Bl	4.0	No
Trout Creek Campsite	3	VCR	N/A	PO	0.7	0.8	Granite	1.6	7	C-L	3.5	Some
Trout Creek Campsite	4	N/A					Granite	2.4	7	L	3.5	No

Site	Vessel #	Surface Finish	Twist	Surface Finish Quality	Width of Surface Texture	Space Between Surface Impressions	Temper	Max Temper Size	Temper Density %	Paste	Mohs Hardness	Residue Present
Tschetter	1	D		M	3.3	3.3	Granite	3.0	10	L-Bl	3.5	No
Tschetter	2	Sm		CO			Granite	3.5	5	L-Bl	3.5	No
Tschetter	3	VCR	N/A	PO	3.2	2.5	Granite	3.0	5	Bl-L	4.0	No
Tschetter	4	R		M				3.8	7	Bl-L	3.0	Yes
Twitchell	1	N/A								Bl-C		Yes
Twitchell	2	N/A										Yes
Upper Kill	1	VCR	S	PO	1.5	2.0	Granite	4.1	5	L	4.0	No
Walter Felt	1	VCR	S	PO	1.5	3.0	Granite	3.2	3	L	3.5	Yes

Table 83: Metric data for vessel forms.

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Antelope Creek	5	11.9	11.9		13.9	36.7				15.9	15.9									
Antelope Creek	6	15.6	17.4	11.7	16.0	30.0														
Antelope Creek	7	15.3	15.3	10.3	15.3															
Antelope Creek	8	19.6	19.6	11.0	19.6	16.7														
Antelope Creek	9	15.1	15.1	10.1	12.3	30.1														
Antelope Creek	10	11.5	11.5		11.9	38.6														
Antelope Creek	11	14.6	15.1			9.7														
Antelope Creek	12	15.2	15.2	12.3	16.2	10.6														
Antelope Creek	13	10.2	10.2	8.2	10.2															
Antelope Creek	14	11.5	11.5	9.3	11.5															
Antelope Creek	15	15.1	16.0	11.2	16.0															
Antelope Creek	16	12.4	12.4	11.0	12.4															
Antelope Creek	17	13.8	13.8	12.2	13.8															
Antelope Creek	18	12.5	12.5	9.5	12.5															
Antelope Creek	19	16.9	20.0	7.7	17.0															
Antelope Creek	20	13.7	13.7	11.5	13.7	5.0	15.0													
Antelope Creek	21	12.4	12.4	8.2	12.4															
Antelope Creek	22	13.1	14.6	9.5	11.6	30.0				9.0	11.5									

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Antelope Creek	23	14.4	15.0	14.5	15.3	10.5				7.5	14.9									
Antelope Creek	24	16.7	17.3	9.9	16.7	17.7				8.0	9.8									
Antelope Creek	25	11.6	12.5	9.6	11.6	9.5	5.0			8.4	9.6									
Antelope Creek	26	11.4	11.4			9.0														
Antelope Creek	27																			
Antelope Creek	28	11.8	11.8	9.1	11.8															
Antelope Creek	29	10.1	11.8		13.0															
Antelope Creek	38	11.8	14.2	7.4	8.7	32.0		11-15		7.1	9.2	18.0	130.0	11.4	11.4			12.8		
Blakiston	1	10.4	12.4	10.1	13.2	25.0		21-25	8	5.6	10.8		110.0	7.7	8.7	160.0		9.6		
Blakiston	2	8.0	8.6	7.6	10.9	19.7			5	8.0	12.9		147.0	7.3	11.1					
Blakiston	3	8.2	8.2	8.7	10.8	42.4		31-35	10											
Blakiston	4	9.6	10.6	8.4	9.4				5											
Blakiston	5					15.0						25.0	145.0							
Blakiston	6									10.4	10.4			12.7	13.9	133.0		10.6		
Blakiston	7																5.8		9.8	5.8
Bodo Bison Skulls	1	9.3	10.9	6.2	11.4				8											
Bodo Bison Skulls	2	7.7	9.5	8.7	10.7	24.4		11-15	20	6.2	12.8		145.0	10.2	11.8	130.0				
Bodo Bison Skulls	3	7.0	8.1	7.9	8.6				10											
Bodo Bison Skulls	5	9.8	12.5	10.0	11.9	10.5			5	10.3	11.2			12.1	12.2					
Bodo Bison Skulls	6	7.5	9.5	8.5	10.5	10.0		11-15	33	6.7	9.0	3.0	150.0				10.9	9.9	13.3	10.9
Bodo Bison Skulls	8	10.3	11.8	11.3	12.1	7.3			5	8.0	9.7									
Bodo Bison Skulls	9	7.9	10.2	10.9	11.8	8.1			4	9.0	9.0									

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Bodo Bison Skulls	10	14.0	14.3	15.1	16.0	9.2			4	9.4	10.3									
Bodo Bison Skulls	11	13.0	14.1	10.7	13.6	2.8			5	7.5	8.5									
Bodo Bison Skulls	12	12.4	13.1	11.2	14.9	8.1			3											
Bodo Bison Skulls	13	10.5	11.0	9.2	10.5				3											
Bodo Bison Skulls	14									6.8	8.3									
Bodo Bison Skulls	15	11.3	11.5	10.0	11.5	5.8	25.0	16-20	12	6.1	10.8	48.5	125.0	10.0	11.6	100.0	7.8	9.7	13.3	7.8
Bodo Bison Skulls	17	10.0	11.6	12.2	13.0	6.0		26-30	12	8.3	10.2	13.3						9.4		
Bodo Overlook	1	11.9	12.5	5.8	13.9				5											
Bodo Overlook	2	8.3	8.3																	
Bodo Overlook	3	9.2	11.6	9.5	9.8				5											
Bodo Overlook	4	10.9	13.9	8.8	11.4				8											
Bodo Overlook	5	13.0	13.4	12.4	13.0	14.1			5	9.4	11.0									
Bridgewater	1	9.0	9.2	7.8	9.8	15.9			5	6.1	8.5			8.0	10.6	130.0		11.0		
Bridgewater	2	7.4	10.1	7.9	10.6	17.5				7.9	8.8			8.1	12.8	130.0	6.4	8.4	8.4	6.4
British Block	1	13.7	14.1	16.1	17.6				6											
British Block	2	9.4	10.3	9.7	10.3	22.3	30.0	21-25	10	9.7	10.6		110.0							
Cache	1	6.0	6.0	6.0	6.0	3.0	50.0	21-25				5.0	100.0			140.0	14.0		14.0	14.0
Cache	2	8.0	8.0										100.0							
Castleforks Buffalo Jump	1	7.2	7.6	7.2	8.3	40.0		21-25	7	6.7	8.5	20.0		7.3	10.3	139.0				
Castleforks Buffalo Jump	2	9.7	10.0	7.7	9.4	13.0	13.0	16-20	14	7.5	8.4									
Castleforks Buffalo Jump	3	7.7	9.3	7.4	7.7				5											

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Castleforks Buffalo Jump	4	9.3	9.7	9.1	9.3	30.0			5											
Castleforks Buffalo Jump	5	6.0	10.7	7.6	9.8	30.0		16-20	10	6.2	10.0	30.0	150.0	11.0	13.0	145.0				
Corey Ranch	1	12.8	15.3	13.0	14.0	17.0	30.0	16-20		8.5	10.5	17.0	130.0	12.0	14.0			16.1		
DgPa-3	1	10.0	18.0	13.0	13.0	12.0		21-25				26.0								
DgPa-3	2	6.0	12.0	6.6	13.0			21-25	15											
DgPa-3	3	5.0	5.0	6.0	6.3															
DgPa-3	4	11.0	11.0	12.6	12.8															
DgPa-4	1	8.3	8.5	8.6	10.3	7.8	40.0	26-30	10	8.6	8.8	8.8	115.0	8.1	9.2			9.2		
DgPa-4	2	18.0	18.0	10.0	17.0	45.0				9.0	10.0	43.0		13.0	13.2	150.0				
Dundurn	1	10.5	11.7	9.9	12.2	8.0	25.0	16-20	69	7.2	9.8	10.9	100.0	9.9	15.8	140.0	16.4	16.4	17.4	16.4
Dundurn	2	8.7	10.1	9.1	10.8	9.8	15.0	16-20	72	9.7	12.7	35.0	110.0	10.8	11.4	120.0	6.6	10.7	9.4	6.6
EbPi-51	2	9.9	12.5	9.3	12.8	12.0				8.2	9.3									
EbPi-51	3	13.2	13.3	10.3	13.2															
EbPi-52	2	13.0	13.0	6.4	11.0															
EbPi-57	1	12.8	12.8	6.4	11.5															
EbPi-57	2	10.5	10.5	6.6	9.4	10.0				8.2	9.2									
EbPi-57	3	13.8	13.8	9.3	11.3															
EbPi-63	1	13.7	13.7	10.9	13.7	12.0				7.4	13.7									
EbPi-63	2	15.5	15.5	10.0	13.0	13.0				9.4	11.4									
EbPi-67	1	13.9	15.4	12.2	12.8	10.0				10.2	11.2									
EbPi-67	2	13.9	15.7	7.4	10.7															
EbPi-67	4	5.8	8.0	6.7	8.6	6.0				8.4	10.5									
EbPi-73	1	12.2	12.2	9.9	10.5															
EbPi-73	2	8.3	8.6	9.0	10.4															
EbPi-73	4	8.3	10.0	9.2	9.3	3.3				9.0	9.4		150.0							
EbPi-73	5	12.8	13.4	11.4	13.0	8.0				9.6	11.6									
EbPi-73	6					9.0				9.8	11.1									
EbPi-73	7	10.7	11.7	9.0	10.8	9.1				5.2	9.7	17.0	165.0							
EbPi-73	8	11.7	11.8	9.0	10.0	10.0				7.0	8.0									
EbPi-73	13	11.4	14.5	8.0	12.0	10.1				6.8	9.7									
EbPi-73	15	7.7	7.7	7.5	7.9															
EbPi-73	16	6.2	6.4	5.7	6.0															
EbPi-73	17	10.7	12.0	11.3	11.4	5.0				9.2	9.2	16.5	150.0	8.4	10.5					
EfOw-26	1	10.7	13.6	7.4	11.6			16-20	5	7.5	8.2			10.8	15.8	163.0				

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
EfOw-26	2	4.6	10.8																	
EgPm-82	1	7.6	8.0																	
EkPf-38	1	9.8	10.6	8.8	9.7	26.8	15.0	16-20	25	8.1	10.7	9.5	147.0	8.8	13.0			9.1		
Ethridge	1			9.0	12.0															
Ethridge	2																			
FM Ranch Campsite	1	9.2	11.8	11.7	15.5	10.1		16-20	22	9.7	11.6	25.4		11.7	11.7					
FM Ranch Campsite	7	9.6	11.2	9.1	10.9				5											
FM Ranch Campsite	8	9.1	13.8	9.7	10.2	8.0	15.0			7.5	9.6	37.0	140.0	7.6	9.2	130.0		7.0		
Fresno	1	4.0	8.0			25.0		21-25								150.0		9.0		
Fresno	2	9.5	12.5			5.0		11-15										7.0		
Fresno	3	11.0	13.0					21-25										14.0		
Fresno	4	11.6	13.4					16-20									13.0	13.0	13.0	13.0
Fresno	5	11.4	12.9	5.0	13.0									13.0	13.0					
Fresno	6	9.0	9.0	7.0	9.0															
Garratt Site	1	5.5	8.8	5.4	8.6	9.0		21-25	50	5.5	7.5	60.0	140.0	5.3	12.1	125.0		9.3		
Garratt Site	4	8.6	9.9	6.1	7.9				5											
Garratt Site	5	8.9	9.6	11.0	12.7			21-25	7											
Garratt Site	6	11.5	14.5	9.0	11.8	27.8		21-25	5											
Garratt Site	7	14.5	16.9	11.9	16.9	13.6			4	11.8	11.8									
Garratt Site	8	10.4	13.4	8.3	11.3			26-30	7											
Garratt Site	9	11.1	12.0	8.9	11.1	10.0			4	8.4	8.4									
Garratt Site	11	8.5	10.4	7.4	9.0				3											
Garratt Site	12	7.2	8.8	8.1	8.2	25.4		21-25	10	7.7	10.2									
Garratt Site	13	13.5	16.1	8.4	17.3	9.3		21-25	12	6.7	8.8									
Garratt Site	14	13.6	13.7	8.5	13.7	15.1		21-25	5	5.9	8.6									
Garratt Site	16	11.1	12.3	9.9	12.1				5											
Grassy Lake Cairn	1	9.1	9.4	8.0	10.4	45.4		11-15	22	6.8	9.9			11.1	14.4	125.0		10.2		
Grassy Lake Cairn	2	11.0	11.5	7.9	10.9	25.0			5	5.9	11.7		150.0	8.7	11.3	130.0		8.1		
Grassy Lake Cairn	3	7.3	9.3	9.4	14.2	15.2			8	7.9	9.5									
Gull Lake	1	6.5	7.0	5.9	6.3	15.7		16-20	5	8.0	10.4									
Gull Lake	2	7.2	7.4	7.4	10.8	21.9			5	10.4	12.5									

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Gull Lake	3	12.5	13.0	5.2	8.1		10.0	31-35	5											
Gull Lake	4	11.6	12.1	5.2	10.0				3											
Gull Lake	5	9.6	11.0	9.4	9.8	30.0		21-25	10	9.3	11.6			11.4	11.4					
Gull Lake	6	10.9	11.9	8.6	10.3	18.1			5	4.2	7.4									
Gull Lake	7	9.0	9.5	8.8	8.8				7											
Gull Lake	8	7.8	7.9	6.5	7.3	15.1			4	6.4	8.8		145.0							
Gull Lake	9	7.3	7.6	7.3	9.2	16.6			5	5.9	9.3		125.0							
Gull Lake	10	12.1	12.3	8.8	10.7				5									9.1		
Gull Lake	12						15.0						120.0			140.0				
Head-Smashed-In	1	15.5	18.7	11.8	18.4	8.7			7	5.8	10.4	47.3	150.0	9.4	12.2	140.0				
Head-Smashed-In	2	12.0	14.0	14.0	14.1	10.0			7	9.4	11.8									
Head-Smashed-In	3	10.8	11.6	6.0	11.0				5											
Head-Smashed-In	4	8.1	9.7	10.4	11.5	12.0			7	8.0	9.0									
Head-Smashed-In	5	7.1	7.3	9.3	11.0				4											
Hunter Valley	1	8.8	11.7	6.9	10.0			16-20	20											
Hunter Valley	2	11.2	13.1	11.3	10.1	17.6	20.0	16-20	12	12.1	12.8	27.0	110.0	12.7	15.9	145.0		11.5		
Hunter Valley	3	10.9	12.4	9.2	11.1	38.8		21-25	25	8.4	11.2	28.8	160.0	11.5	13.3	135.0		10.4		
Hunter Valley	4									9.4	10.5			11.1	16.8					
Junction	1	7.7	9.6	6.9	8.6	27.3		26-30	25	7.7	8.3		120.0	7.0	8.0	150.0		10.8		
Junction	2	8.8	9.5																	
Junction	3	7.4	7.8	7.3	11.1	31.1		16-20	22	10.1	14.3	20.1	100.0	8.0	9.9					
Junction	4	6.6	7.7	7.9	9.7	27.1	15.0	16-20	45	9.2	11.7	23.5	110.0					12.6		
Junction	5	7.7	8.7	7.2	8.2				5											
Junction	6	8.1	9.6	6.9	9.4				5											
Junction	7	11.2	11.5	10.0	11.7	5.0			5	8.7	10.0									
Junction	8	11.7	13.2	12.0	14.1	7.0			8	10.0	12.0							10.2		
Junction	9	7.1	7.6	6.0	7.8															
Junction	11	6.5	8.4	7.5	9.4	23.0		16-20	25	9.4	10.6									

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Junction	12	6.3	6.5	8.3	8.8	2.5			5	8.7	8.9									
Junction	13	9.2	9.5	11.0	11.3				3											
Junction	14	8.7	9.1	10.9	11.3			16-20	10									9.0		
Junction	15	6.6	11.7	8.1	11.3			16-20	8											
Junction	16	9.5	9.8	8.1	9.7	20.5	5.0		10	6.3	8.9									
Junction	18	9.4	12.4	6.3	12.8	19.2		21-25	10	8.9	10.1									
Junction	19	7.6	10.2	8.9	10.2				2									11.3		
Junction	20	5.9	6.1	8.2	8.3	17.8														
Junction	23	7.8	9.0	8.9	9.5	36.7		16-20	10	9.0	9.0									
Junction	24	6.5	7.3	7.1	9.7				4											
Junction	27	8.5	8.6	11.5	12.6															
Junction	28	7.9	8.4	7.0	8.1	12.8	35.0	16-20	10	7.3	8.7							11.5		
Junction	29	5.9	6.9	8.7	12.0				5											
Kenny	1	14.8	16.1	6.7	16.2	16.0		16-20	32	6.0	8.4		160.0	6.5	7.1	150.0	10.3	8.2	11.1	10.3
Little Bow	1	11.4	12.3	9.5	12.3	34.0			15											
Little Bow	2	12.4	13.3	11.4	11.8				5											
Little Bow	3	6.0	7.0	6.0	9.0	8.7				5.0	8.0			8.0	8.0					
Little Bow	4	12.7	12.7	8.0	9.7	33.3			5	8.5	8.5									
Little Bow	5	7.4	7.6	7.0	7.0				2											
Little Bow	6	8.0	8.0	7.0	7.0															
Little Bow	7	7.9	8.0	8.0	8.4				5											
Little Bow	8	8.0	8.0	8.0	8.0															
Little Bow	9	8.4	8.9	8.1	9.5				5											
Little Bow	10	9.7	10.5	7.4	8.0				5											
Little Bow	11	8.9	10.5	9.3	10.7				5											
Little Bow	12	7.7	8.7	7.0	8.0															
Miry Creek	1	12.1	12.1	8.6	9.5	24.0				9.5	9.7									
Miry Creek	2	10.6	13.7	9.2	12.0		15.0													
Miry Creek	3	6.5	11.2	11.2	11.2	6.3				7.6	9.5									
Miry Creek	4	11.3	11.3	10.8	11.3															
Miry Creek	5	7.4	9.7	7.0	10.8	15.0				8.8	14.1									
Miry Creek	6	7.0	10.0	12.5	10.0															
Miry Creek	7	11.4	12.4	8.0	11.4															
Miry Creek	8	11.1	11.4	7.2	12.9															
Miry Creek	9	11.4	12.4	10.0	11.5															
Miry Creek	10	9.7	10.0	8.2	10.7															

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Miry Creek	11	12.1	12.5	11.0	13.0															
Miry Creek	12	11.1	11.2	11.0	12.0															
Miry Creek	13	8.8	8.8	8.6	9.0															
Miry Creek	14	12.3	14.9	7.8	11.1															
Miry Creek	15	11.3	13.0	10.0	11.4	6.8				6.7	7.5									
Miry Creek	16	20.6	20.6	8.4	16.0															
Miry Creek	17	8.5	9.8		7.7	9.1				6.7	7.8									
Miry Creek	18	3.3	6.6	3.3	11.4	34.0				9.0	9.3									
Miry Creek	19	13.2	14.9	9.3	14.0															
Miry Creek	20	13.6	13.6	9.6	14.0															
Miry Creek	21	6.2	6.2	6.2	9.0															
Miry Creek	22	11.0	12.9	8.7	12.0															
Miry Creek	23	12.1	12.5	9.5	12.4			11-15												
Miry Creek	24	12.3	12.6	9.8	12.3															
Miry Creek	25	13.7	13.7	11.8	12.8															
Miry Creek	26	10.2	10.9	6.6	9.1															
Miry Creek	27	12.1	12.1	7.9	12.1															
Miry Creek	28	13.8	15.3	10.2	15.3	28.5	10.0	16-20		6.5	11.4									
Miry Creek	29	10.1	10.1	9.6	12.0	35.0								11.6	15.8					
Miry Creek	30	9.9	11.9	9.2	10.5															
Morkin	1	12.6	15.1	14.1	16.4	8.9	10.0	21-25	10	13.3	15.0	23.0	145.0	15.7	16.5	160.0		13.4		
Morkin	2	8.8	9.2	7.7	9.1	10.6			5	8.3	8.3									
Morkin	3	8.9	11.5	4.5	5.9				5											
Morkin	4	4.7	6.6	6.9	9.4	20.0		21-25	18											
Morkin	5	12.6	13.2	8.9	11.7			21-25	13											
Morkin	6	14.0	14.5	11.2	11.2				3											
Morkin	7													7.3	12.9	110.0				
Morkin	8	7.8	8.9	7.9	8.2				5											
Morkin	9	9.4	10.2	8.2	8.8	21.4			5	6.4	7.7									
Morkin	10	9.0	9.0	7.0	9.0			21-25										11.1		
Morkin	11	11.8	13.4	9.1	13.8	10.3		21-25	8	9.8	11.0	25.3	165.0	11.6	13.1					
Morkin	12	10.3	10.9	9.4	10.6	27.3	10.0		5											
Morkin	13	13.5	13.7	10.6	13.5	8.4			5	10.6	9.0									
Morkin	14	10.1	10.4	9.8	10.4	3.0			5											
Morkin	15	9.6	10.9	9.0	13.4	35.0			5	6.7	11.7									
Morkin	16	10.3	10.9	10.8	13.4	33.5			5											

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Old Women's Buffalo Jump	1	7.5	9.0	10.0	11.5	5.6			5	7.3	12.0			10.3	12.4					
Piche Pot	1	15.0	16.0	11.0	13.0	23.0	25.0	21-25		10.0	12.0	40.0		8.0	12.0	160.0	15.0	10.0	15.0	15.0
Pouliot	1	10.5	12.0	11.0	11.0	12.0	25.0	26-30		8.0	10.0	15.5	153.0				24.0	12.0	24.0	24.0
Ross	1	8.8	19.8	8.2	17.0	13.5		21-25	4	5.6	9.2	33.0	130.0	8.2	17.6	115.0		11.4		
Ross	2	13.2	18.4	12.4	18.0	13.7		21-25	15	9.3	14.7			16.0	16.0	120.0		11.8		
Ross	3	8.7	14.2	9.1	14.9	9.0		26-30	10	8.3	10.6									
Ross	4	11.1	11.9	8.9	12.2	9.3	40.0	16-20	15	8.9	12.7	19.3	100.0	10.9	13.5	150.0				
Ross	5	12.1	14.9	11.5	17.6	15.0		21-25	10	8.4	9.1									
Ross	6	10.9	11.0	9.5	11.8	7.8			7	7.8	9.1									
Ross	7	16.5	17.8	9.6	12.0				6											
Ross	8	9.3	13.7	6.3	12.0	28.5			22	6.8	7.2	20.1	160.0	7.0	8.4	140.0				
Ross	9	11.2	13.5	6.9	13.4	8.7		16-20	34	5.8	6.6									
Ross	10	12.9	13.2	12.7	13.5	8.4		16-20	13	8.9	9.5	36.0	155.0							
Ross	11	12.9	13.2	11.4	14.8	8.5		16-20	17	7.0	10.4									
Ross	12	10.3	15.4	9.4	14.8	8.6			20	6.3	9.3									
Ross	13	8.0	8.5	8.7	9.5	5.6	15.0		5	8.4	10.0									
Ross	14	9.8	11.5	7.8	10.8				6											
Ross	15	11.8	12.7	8.3	11.6				3											
Ross	16	10.2	11.3	10.7	10.9	8.7			3	7.9	8.4									
Ross	17	11.0	11.2	11.8	12.6				3											
Rumsey Cairn	1	13.5	14.2	11.8	14.2	4.8			5	10.3	11.0									
Rumsey Cairn	2																			
Saamis	1	11.0	13.0	7.0	11.0									8.0	10.0	130.0				
Saamis	2	10.0	13.0	10.0	12.0	25.0		16-20												
Saamis	3	16.0	16.0	7.0	14.0				5					10.0	10.0					
Saamis	4	10.3	10.3	7.3	11.0	9.3		42309		7.0	8.6									
Saamis	5	19.0	19.0	4.0	6.5															
Saamis	6	7.0	7.0	9.0	9.0															
Saamis	7	11.0	11.0	6.0	10.0	11.5				4.9	5.4									
Saamis	8	11.0	13.0	10.0	13.0	11.0				5.0	5.0									
Saamis	9	11.0	13.0	5.0	13.0															
Saamis	10	10.0	13.0	10.0	13.0	11.0				8.0	11.0									

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Saamis	11	12.0	12.0	10.0	12.0	9.0				5.0	9.0									
Saamis	12	12.0	13.0	10.0	12.0	40.0		11-15						15.0	15.0	135.0				
Saamis	13	7.0	9.0	7.0	9.0				4											
Saamis	14	12.0	13.0	10.0	13.0			11-15						13.0	13.0	135.0				
Saamis	15	13.0	15.0	12.0	15.0															
Saamis	16	7.0	8.0	4.0	7.0															
Saamis	17	7.0	9.0	4.0	9.0															
Saamis	18	9.0	9.0	7.0	9.0															
Saamis	19																	10.0		
Sherwin Campbell	1	17.8	17.8	9.1	16.4				5											
Sherwin Campbell	2	10.0	10.5	7.7	10.2				5											
Sherwin Campbell	3	9.5	10.2	9.1	10.2	10.0	20.0		5	7.7	10.4	31.5	145.0	9.0	10.6	165.0		12.6		
Sherwin Campbell	4	16.2	16.8	16.5	17.8	13.2			5	10.1	11.1									
Sherwin Campbell	5	14.8	16.4	10.0	16.4	10.0			5	8.1	10.9							10.1		
Sherwin Campbell	6	15.8	16.6	17.4	18.2	13.5			8	11.7	16.5							12.6		
Sherwin Campbell	7	15.6	16.6	13.3	15.4	8.0			6	13.7	13.8	28.0								
Sherwin Campbell	8	17.3	17.3	13.0	17.7				5											
Sherwin Campbell	9	16.8	21.2	15.6	17.4	7.4			7	10.2	11.1									
Sherwin Campbell	10	15.5	15.7	13.8	16.4	14.1			6	10.3	10.9									
Sherwin Campbell	11	17.8	19.6	11.8	19.3				4											
Sherwin Campbell	12	16.9	18.6	9.2	16.8				5											
Sherwin Campbell	13	18.2	18.2	12.6	18.6				3											
Sherwin Campbell	14	12.1	12.1	11.2	12.7				3											

Site	#	Lip Width Min	Lip Width Max	Rim Width Min	Rim Width Max	Rim Height	Rim Angle	Rim Diameter	Rim %	Neck Width Min	Neck Width Max	Neck Height	Neck Angle	Shoulder Width Min	Shoulder Width Max	Shoulder Angle	Body Width Min	Body Width Max	Base Width Max	Base Width Min
Sherwin Campbell	15	14.5	15.1	13.5	15.0	9.2			5	10.5	11.4		140.0							
Sherwin Campbell	16	6.4	6.9	7.1	8.2				4											
Sherwin Campbell	17	5.2	6.1	7.3	9.5				2											
Sherwin Campbell	18	7.7	7.9	7.9	8.5				2									10.7		
Sherwin Campbell	19	12.5	13.9	9.5	13.7				3											
Sherwin Campbell	20	9.3	9.3	10.6	12.5				2											
Tipperary Creek	1	12.6	16.3	11.7	15.6	8.5	30.0	21-25	28	10.2	14.1	41.5	115.0	11.8	15.8	120.0	13.0	11.7	18.0	13.0
Trout Creek Campsite	1	8.9	11.3	5.7	11.5				17											
Trout Creek Campsite	2	7.9	8.9	6.6	8.0				5											
Trout Creek Campsite	3	12.4	12.8	4.4	13.7				9											
Trout Creek Campsite	4	9.8	10.9	8.4	11.2				4											
Tschetter	1	12.6	14.5	13.1	13.5	8.0		21-25	23	10.5	11.0	9.0	170.0				13.5	14.9	15.1	13.5
Tschetter	2	10.8	11.5	9.7	11.9	9.3			5	7.5	8.7									
Tschetter	3	8.5	9.2	7.1	9.4				5											
Tschetter	4	12.9	13.3	11.9	13.3				5											
Twitchell	1	9.0	9.0	6.0	9.0															
Twitchell	2	6.0	7.0	6.0	6.0															
Upper Kill	1													8.3	12.7	140.0				
Walter Felt	1	9.9	11.2	8.5	10.4	18.0		16-20	43	6.7	11.2	19.0	145.0	10.0	11.5	145.0		12.4		

Table 84: Metric data for decorative elements.

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
Antelope Creek	20	Rim	Incised Line		Right Oblique	1			14.3	4.5	0.0			8.8
Antelope Creek	21	Rim	Finger Impr.		Vertical	1				9.9	0.0			5.2
Antelope Creek	22	Rim	Linear Impr.		Right Oblique	1				4.1	0.0			
Antelope Creek	23	Rim	Angular Impr.		Vertical	1			7.6	3.6	0.0	4.5	10.1	
Antelope Creek	24	Lip	Punctate		Vertical	1		8.4	2.0	2.0		36.0		
Antelope Creek	25	Lip	CWT	N/A	Right Oblique	1			9.0	1.9		3.6	6.0	4.0
Antelope Creek	26	Lip	CWT	N/A	Right Oblique	1				2.2				5.0
Antelope Creek	27	Lip	Dentate		Right Oblique	1				3.3				
Antelope Creek	28	Lip	CWT	N/A	Vertical	1				4.1				
Antelope Creek	29	Rim	Linear Impr.		Right Oblique	1			11.1	1.9	0.0			8.1
Blakiston	1	Lip	CWT	Z	Right Oblique	1		1.3	9.5	3.8		3.1	5.7	3.3
Blakiston	1	Rim	Finger Pinch		Vertical	1		4.6	11.3	9.0	7.3	2.0	2.4	2.0
Blakiston	2	Lip	CWT	Z	Right Oblique	1		1.7	10.1	4.4		5.4		5.4
Blakiston	2	Rim	Finger Pinch		Vertical	1		2.9	10.0	8.4	8.5	2.1		2.1
Blakiston	3	Lip	Dentate		Left Oblique	1		1.1	12.9	0.8		1.5	2.9	2.2
Blakiston	5	Rim	Hole			1			6.0	6.0	15.0			25.0
Bodo Bison Skulls	1	Lip	Fingernail Impr.		Vertical	1		1.0	6.3	1.8				
Bodo Bison Skulls	1	Rim	Fingernail Impr.		Vertical	1		0.8	5.5	2.2	0.0	13.4		13.4
Bodo Bison Skulls	2	Rim	Finger Pinch		Vertical	1		3.2	9.5	13.0	0.0	2.6	4.2	3.7
Bodo Bison Skulls	2	Shoulder	Fingernail Impr.		Vertical	1		2.7	11.1			4.6	7.2	5.7
Bodo Bison Skulls	5	Neck	Incised Line		Vertical	1		1.0		4.0				
Bodo Bison Skulls	6	Lip	CWT	Z	Right Oblique	1		1.4	9.8	7.2		3.3	9.2	6.8
Bodo Bison Skulls	9	Rim	Angular Impr.		Vertical	1		1.6	7.1	5.2	0.0	1.6	3.6	
Bodo Bison Skulls	10	Rim	Angular Impr.		Vertical	1		1.7	4.6	4.2	0.0	4.5	5.3	
Bodo Bison Skulls	14	Neck	CWT	Z	Horizontal	3		0.4	8.1	1.6		1.0	1.7	
Bodo Bison Skulls	14	Neck	Hollow Impr.		Right Oblique	1		1.3	3.2	1.6		1.8	3.2	2.0
Bodo Bison Skulls	15	Lip	Incised Line		Right Oblique	1		1.6	13.9	2.6		5.8	7.6	7.2
Bodo Bison Skulls	15	Shoulder	Finger Pinch		Vertical	1		3.7	12.3	10.3		1.9	4.3	2.4
Bodo Bison Skulls	17	Neck	Punctate		Vertical	1		5.8	9.5	11.3				34.8
Bodo Overlook	1	Lip	Dentate		Vertical	1		0.7	11.1	1.2		1.5	2.8	1.8

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
Bodo Overlook	1	Lip	Linear Impr.		Left Oblique	1		0.7	12.2	1.0		1.8	2.6	2.5
Bodo Overlook	1	Rim	Finger Pinch		Vertical	1		2.2	12.0	8.8	0.0			
Bodo Overlook	1	Rim	Dentate		Horizontal	2	2.6	1.3	1.2	2.0	24.0			
Bodo Overlook	2	Lip	Dentate		Left Oblique	1		1.3	8.8	0.9		1.1	2.4	1.8
Bodo Overlook	4	Lip	CWT	S	Right Oblique	1		1.4	14.0	4.3		2.1	5.0	3.0
Bodo Overlook	4	Rim	Finger Pinch		Horizontal	1		2.4	10.8	8.1	0.0	0.6		
Bridgewater	2	Shoulder	Punctate		Vertical	1		2.5	2.5	2.5				5.8
Castleforks Buffalo Jump	1	Shoulder	Finger Impr.		Vertical	1		3.9	12.6	12.2		2.5	2.8	2.5
Castleforks Buffalo Jump	4	Lip	CWT	N/A	Right Oblique									
Castleforks Buffalo Jump	5	Rim	Finger Pinch		Right Oblique	1		3.0	6.0	7.0	0.0	1.6	1.8	1.7
Castleforks Buffalo Jump	5	Shoulder	Fingernail Impr.		Vertical	1			9.9					
Corey Ranch	1	Rim	CWT	N/A	Right Oblique	1		2.0	14.5	5.2	0.0			
DgPa-3	1	Rim	Finger Impr.			1			8.2	8.0	0.0			
DgPa-3	2	Lip	Tiny Punctates			1			1.8	1.8		3.5	4.9	4.0
DgPa-3	3	Rim	Fingernail Impr.		Vertical	1			5.3	1.2	0.0			
DgPa-3	4	Rim	Finger Impr.		Vertical	1								
Dundurn	1	Lip	CWT	Z	Right Oblique	1		1.2	9.9	6.5		5.2	7.9	6.2
Dundurn	2	Lip	CWT	S	Right Oblique	1		1.6	16.0	5.5		4.1	6.3	5.8
EbPi-51	2	Rim	Punctate		Vertical	1					11.0			
EbPi-51	3	Rim	Punctate		Vertical	1		10.7			12.0			
EbPi-52	2	Rim	Finger Pinch		Vertical	1			7.8	10.5	0.0			4.5
EbPi-57	1	Lip	CWT	N/A	Left Oblique	1				2.4				6.1
EbPi-57	1	Rim	Incised Line		Converging/Inverted V	1					7.0			
EbPi-63	2	Rim	Finger Impr.		Vertical	1			10.3	2.5	0.0			
EbPi-67	1	Rim	CWT	N/A	Right Oblique	1			14.8	3.9	0.0	7.5	8.5	
EbPi-73	5	Rim	Finger Impr.		Vertical	1			8.3	7.5	0.0			
EbPi-73	13	Lip	Incised Line		Right Oblique	1			10.0	2.3				
EgPm-82	1	Lip	CWT	N/A	Right Oblique	1				1.5				3.5
FM Ranch Campsite	2	Lip	Linear Impr.		Right Oblique	1		2.0	11.2	1.6		9.6	15.1	

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
FM Ranch Campsite	3	Body	Paddle-edge			1								
FM Ranch Campsite	3	Lip	CWT	S	Right Oblique	1		1.5	12.0	3.9		12.1	18.5	15.0
FM Ranch Campsite	3	Neck	Paddle-edge			1								
Fresno	3	Lip	Linear Impr.		Left Oblique	1		1.5	10.6	1.5		1.8	4.0	3.0
Fresno	4	Lip	CWT	Z	Left Oblique	1			13.0	1.7		1.8	2.0	2.0
Fresno	5	Lip	CWT	N/A	General Oblique	1			10.8	3.8		2.5	3.2	3.0
Fresno	5	Rim	Hole		Vertical	1					5.0			
Fresno	6	Rim	Punctate		Vertical	1		5.0	8.5	9.5	13.0	9.0	13.0	
Garratt	1	Lip	CWT	N/A	Right Oblique	1		1.0	11.2	1.6		4.5	12.0	10.0
Garratt	1	Shoulder	CWT	Z	Right Oblique	1		1.0	10.5	2.0		8.5	20.0	15.0
Garratt	4	Lip	Incised Line		Zig-zag	1		1.4	8.9	2.7		19.1		
Garratt	6	Lip	CWT	S	Right Oblique	1		1.9	17.4	6.7		1.2	3.1	2.0
Garratt	7	Lip	Punctate		Vertical	1		7.0	4.4	4.4				
Garratt	9	Lip	CWT	Z	Right Oblique	1		2.0	11.0	4.9		2.9	6.5	4.0
Garratt	12	Neck	Paddle-edge			1								
Garratt	13	Lip	CWT	Z	Right Oblique	1		0.9	12.6	3.3		3.3	5.3	4.2
Garratt	14	Lip	Angular Impr.		Canaliculate	1		0.7	3.6	2.3		1.1	1.5	1.3
Garratt	16	Lip	Incised Line		Left Oblique	1		1.2	12.4	1.7		5.2	7.7	
Grassy Lake Cairn	3	Rim	Finger Impr.		Vertical	1		2.8	8.9	10.7	1.0	1.6	2.7	1.9
Gull Lake	3	Lip	CWT	N/A	Vertical	1		1.9	11.8	7.1		1.3	3.4	2.1
Gull Lake	5	Lip	CWT	Z	Horizontal	2	7.5	1.2	5.1	1.7		3.1	4.6	2.8
Gull Lake	5	Neck	Cord Impr.		Horizontal	6	5.2	0.6	2.0			5.0	6.6	5.4
Gull Lake	6	Rim	Angular Impr.		Right Oblique	1		2.8	8.0	2.4	0.0	9.2		9.2
Gull Lake	10	Lip	Angular Impr.		Right Oblique	1		1.4	5.2	3.3		4.9	5.4	4.9
Head-Smashed-In	2	Rim	Fingernail Impr.		Vertical	1		0.7	6.7	1.7	0.0	7.2	10.7	8.3
Head-Smashed-In	3	Lip	Linear Impr.		Left Oblique	1		1.7	14.6	4.3		3.6	4.6	
Head-Smashed-In	3	Rim	Incised Line		Horizontal	1		1.4	4.5		9.3			
Head-Smashed-In	4	Rim	Angular Impr.		Right Oblique	1		1.3	6.8	2.6	1.0	7.2	11.7	
Hunter Valley	2	Lip	CWT	Z	Left Oblique	1		1.1	11.5	4.9		3.8	8.3	5.4
Hunter Valley	2	Shoulder	Finger Pinch		Vertical	1		2.9	10.6	10.7		2.4	3.2	2.8

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
Hunter Valley	3	Body	Paddle-edge			1								
Hunter Valley	3	Lip	Hollow Impr.		Canaliculate	1		2.2	3.0	3.3		10.4	15.1	13.5
Hunter Valley	3	Rim	Linear Impr.		Vertical	1		0.7	3.4	1.2	0.0	3.1	6.9	4.4
Hunter Valley	3	Shoulder	Finger Pinch		Vertical	1		3.4	11.5	11.1		2.2	2.2	2.2
Hunter Valley	4	Shoulder	Finger Pinch		Vertical	1		3.2	12.4	12.0		3.1	3.7	3.2
Junction Site	1	Lip	Linear Impr.		Zig-zag	1				2.1		6.1	9.1	
Kenny	1	Lip	CWT	Z	Right Oblique	1		1.0	14.0	5.2		1.4	5.4	3.5
Kenny	1	Neck	Irreg. Punctate		Vertical	1		2.8	10.7	4.6		11.7	15.6	12.3
Little Bow	1	Lip	CWT	S	Right Oblique	1		1.0	12.0	4.6		4.8	5.0	5.0
Little Bow	1	Rim	Punctate		Vertical	1		7.5	8.5	8.8	7.3			20.0
Little Bow	2	Lip	CWT	N/A	Right Oblique	1		0.9	10.3	10.5		2.6		2.6
Little Bow	2	Rim	Punctate		Vertical	1		8.1		7.8	6.5			
Little Bow	4	Rim	CWT	S	Vertical	2	7.3	1.2	6.5	3.2	0.0	3.5	4.0	3.7
Little Bow	6	Rim	Incised Line		General Oblique	1					0.0			
Little Bow	8	Rim	Incised Line		Vertical	1				2.5	0.0			4.0
Little Bow	11	Rim	Punctate		Vertical	1		7.4	9.4		21.6			
Little Bow	12	Lip	Linear Impr.		General Oblique	1								
Miry Creek	6	Rim	Cord Impr.		Right Oblique	1			10.0		0.0			
Miry Creek	7	Lip	Dentate		Left Oblique	1								
Miry Creek	8	Lip	Incised Line		Right Oblique	1						4.7	6.5	
Miry Creek	9	Lip	CWT	N/A	Left Oblique	1				4.9				
Miry Creek	10	Lip	CWT	N/A	Right Oblique	1		0.3						
Miry Creek	11	Lip	Linear Impr.		Right Oblique	1				2.5				3.7
Miry Creek	13	Lip	Linear Impr.		Vertical	1				0.8				2.0
Miry Creek	14	Rim	Angular Impr.		Vertical	1				4.6	0.0			8.9
Miry Creek	15	Rim	CWT	N/A	Right Oblique	1				3.8	0.0	3.9	6.5	4.5
Miry Creek	16	Rim	Incised Line		Right Oblique	1			4.5		0.0			
Miry Creek	17	Rim	Fingernail Impr.		Vertical	1			8.4	3.5	0.0			8.0
Miry Creek	18	Rim	CWT	N/A	Horizontal	2	5.5			2.7	2.8			
Miry Creek	19	Rim	Fingernail Impr.		Vertical	1			9.0		0.0	11.6	15.0	13.0
Miry Creek	20	Rim	CWT	N/A	Right Oblique	1				3.4	0.0			
Miry Creek	21	Rim	CWT	N/A	Horizontal	3				3.2	2.5			
Miry Creek	22	Rim	CWT	N/A	Right Oblique	1					0.0			
Miry Creek	23	Lip	Dentate		Vertical	1				2.4				3.3

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
Miry Creek	23	Rim	Irreg. Punctate			1			16.7	7.1	23.0			18.3
Miry Creek	24	Lip	Dentate		Right Oblique	1				1.0		2.4	3.6	
Miry Creek	24	Rim	Finger Impr.		Vertical	1			8.8	7.7	20.8			
Miry Creek	25	Rim	Angular Impr.		Vertical	1			2.4	2.4	0.0			
Miry Creek	26	Lip	CWT	N/A	Right Oblique	1								
Miry Creek	26	Lip	Angular Impr.		Vertical	1				4.2		4.0	5.7	4.8
Miry Creek	27	Lip	Angular Impr.		Vertical	2				2.4				7.9
Miry Creek	28	Neck	Incised Line		Zig-zag	1								
Miry Creek	28	Rim	Angular Impr.		Vertical	1				4.5	0.0	8.3	9.5	8.9
Miry Creek	29	Lip	Linear Impr.		Vertical	1				1.9		3.3	4.6	
Miry Creek	29	Lip	CWT	N/A	Horizontal	1								
Miry Creek	29	Rim	Cord Impr.		Left Oblique	1			10.0					
Miry Creek	30	Rim	Finger Pinch		Vertical	1					0.0			
Morkin	2	Lip	Linear Impr.		Zig-zag	2			9.5	5.0		3.4	3.7	3.5
Morkin	5	Rim	Hole		Vertical	1		100.0	5.0	5.0	8.8	21.7		21.7
Morkin	5	Rim	Hole		Vertical	1		100.0		5.0	11.3	13.5		
Morkin	6	Rim	Hole		Vertical	1					8.0			
Morkin	9	Rim	Angular Impr.		Vertical	1		2.0	7.0	3.3	0.0	3.0	3.7	3.3
Morkin	10	Rim	Punctate			1			4.5	4.5	19.0			
Morkin	10	Rim	Boss		Vertical	1		6.5	9.5	9.5	15.0			
Morkin	12	Rim	Linear Impr.		Left Oblique	1		1.2	8.5	1.0	0.0	6.2	7.7	7.0
Morkin	12	Rim	Irreg. Punctate			1		6.4			24.5			
Morkin	15	Lip	Dentate		Right Oblique	1		0.7	8.7	1.7		2.5	3.0	2.6
Old Women's Buffalo Jump	1	Rim	Fingernail Impr.		Vertical	1		0.8	4.0	0.8	0.0	3.7	5.0	4.4
Piche Pot	1	Lip	Angular Impr.		Right Oblique	1								
Ross	1	Rim	Finger Pinch		Vertical	1		2.8	7.4	9.5	0.0	2.8	4.3	3.4
Ross	1	Shoulder	Finger Pinch		Vertical	1		4.0	11.0	10.0		2.7	3.0	2.8
Ross	2	Rim	Finger Pinch		Vertical	1		3.3	7.3	9.0	0.0	3.0	3.1	3.1
Ross	3	Rim	Finger Pinch		Vertical	1		3.0	7.7	7.2	0.0	4.0	7.0	5.2

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
Ross	8	Lip	Linear Impr.		Right Oblique	1		1.1	6.8	2.5				2.9
Ross	12	Rim	Finger Pinch		Vertical	1		1.3	6.2	3.5	0.0	4.0	6.7	4.5
Ross	13	Rim	Hollow Impr.		Vertical	1		1.8	3.0	3.0	5.7	10.7	10.7	10.7
Ross	14	Rim	Cord Impr.		Vertical				15.0	2.0	23.0	0.9	1.4	1.0
Ross	14	Rim	Tiny Punctates		Left Oblique	1			0.7	1.5		4.7	8.6	6.0
Rumsey Cairn	2	Body	Paddle-edge			1								
Rumsey Cairn	2	Neck	Paddle-edge			1								
Rumsey Cairn	2	Shoulder	Paddle-edge		Right Oblique	1			16.0	7.0				
Saamis	1	Rim	Finger Pinch		Vertical	1		4.0		10.0	0.0			1.0
Saamis	1	Shoulder	Finger Pinch		Vertical	1		4.0		10.0				1.0
Saamis	2	Rim	Finger Impr.		Vertical	1		2.0	6.0	10.0	0.0			
Saamis	5	Lip	CWT	N/A	Right Oblique	1		1.5	14.0	5.0				
Saamis	6	Rim	Fingernail Impr.		Vertical	1		2.0	7.0	5.0	0.0	6.0	8.0	9.0
Saamis	9	Rim	Finger Pinch		Vertical	1			6.0	7.0	0.0	3.0	4.0	
Saamis	14	Rim	Angular Impr.		Vertical	1		2.0	6.0	3.0	0.0			10.0
Saamis	14	Shoulder	Angular Impr.		Vertical	1		2.0	11.0	3.0				15.0
Saamis	16	Lip	CWT	N/A	Right Oblique	1		2.0	13.0	4.0				
Saamis	18	Lip	Dentate			1								
Saamis	18	Neck	Dentate		Horizontal	4+	3.0							
Saamis	18	Rim	CWT	N/A	Vertical	1		1.5	5.0	2.0	4.0			
Saamis	18	Rim	Dentate		Horizontal	2								
Saamis	19	Rim	Tiny Punctates			1					0.0			
Saamis	19	Rim	Hole		Vertical	1			3.0	3.0	3.5			7.0
Saamis	19	Shoulder	Angular Impr.		Vertical	1		2.0	11.0	4.0				
Sherwin Campbell	1	Rim	CWT	N/A	Left Oblique	1		3.9	9.7	2.7	0.0	6.3	7.7	
Sherwin Campbell	2	Rim	CWT	N/A	Vertical	2		1.2	12.5	2.0	0.0	3.9	5.2	4.0
Sherwin Campbell	3	Lip	CWT	Z	Right Oblique	1		1.7	12.0	2.7				
Sherwin Campbell	4	Rim	Linear Impr.		Left Oblique	1		2.5	10.5	3.3	0.0	6.1	8.3	
Sherwin Campbell	5	Lip	CWT	S	Right Oblique	1		1.9	12.0	5.1				
Sherwin Campbell	8	Lip	Fingernail Impr.		Right Oblique	1		1.0	6.3	1.0		7.2	7.2	
Sherwin Campbell	9	Lip	Linear Impr.		Right Oblique	1		1.5	20.3	3.5		8.2		

Site	Vessel #	Portion	Decorative Element	Cord Twist	Orientation	# of Rows	Space Between Rows	Depth	Height	Width	Distance from Lip Edge	Min Space	Max Space	Avg Space
Tipperary Creek	1	Lip	CWT	S	Right Oblique	1		1.2	21.3	4.8		4.5	5.2	4.9
Trout Creek Campsite	3	Lip	CWT	Z	Right Oblique	1		0.6	12.5	4.0				
Trout Creek Campsite	4	Lip	CWT	N/A	Left Oblique	1		0.8	12.7	6.8				3.4
Tschetter	1	Lip	CWT	N/A	Right Oblique	1		2.0	15.1	2.7		9.8	13.5	11.5
Tschetter	2	Rim	Linear Impr.		Left Oblique	1		1.8	8.7	1.4	0.0	7.6	8.5	7.9
Tschetter	4	Rim	CWT	N/A	Zig-zag	1		1.1	13.5	2.0	0.0	6.8		6.8
Tschetter	4	Rim	CWT	N/A	Horizontal	3	4.4	1.4	2.3		18.4			
Twitchell	1	Rim	CWT	N/A	Vertical	2				3.0	0.0			3.0
Twitchell	2	Rim	CWT	N/A	Right Oblique	1				3.0	0.0			3.5
Upper Kill	1	Shoulder	Linear Impr.		Left Oblique	1		2.3	6.8	1.3		5.6	7.4	